Journal
OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION

Opening and Closing Sessions—Philadelphia Meeting

Address of the President-Elect at the Philadelphia Meeting—*R. E. Rebrassier* 291
President Armistead's Report to the House of Delegates 296
Impact of Socioeconomic Conditions on the Practice of Medicine and Veterinary Medicine—*James Z. Appel* 297
Dr. H. E. Kingman, Jr., Appointed Executive Secretary 301
Secretary Benson Elected Honorary Member 302
New Members of the Board of Governors 305
Convention Attendance at Philadelphia—3,550 305
1961 and 1962 Convention Sites Selected 305

General Articles

Treatment of Chronic Copper Poisoning in Sheep—*R. E. Pierson and W. A. Aanes* 307
Anaplasmosis and Concurrent Copper Intoxication in Sheep—*Ryff—Gilbert—Weibel—Breen* 312
Tranquilizing Drugs in Human and Veterinary Medicine—*Werner Tuteur* .. 316

Surgery and Obstetrics

Fracture Repairs with the Jonas Splint—Five-Year Report on All Published Cases—*Salo Jonas and Albert M. Jonas* 318

Clinical Data

Use of a New Adrenocortical Steroid (Ultracortenol) in Bovine Ketosis—*R. F. Vigue* 326
A Diagnostic Test for Organic Phosphate Insecticidal Poisoning of Swine—*Dennis H. Cox and Dorothy M. Harris* 329
Pulmonary Pathology in Dogs Due to Air Pollution—*Catcott—McCammon—Kotin* 331
What Is Your Diagnosis? ..... adv. p. 37

Nutrition

Enzootic Ataxia from Copper Deficiency in Sheep in Colorado—*Jensen—Maag—Flint* 336

Editorial

Veterinary Medicine—The Publication 341

The News ..... 344 **Organization Section ..... adv. p. 27**

Correspondence, adv. p. 4; Coming Meetings, adv. p. 32
Washington News ..... adv. p. 12

Contents continued on adv. pages 2 and 4

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CONTENTS

Continued from Cover

SURGERY AND OBSTETRICS

Estrus in Cows During Pregnancy 325
Contamination of Incisions with Cancer Cells 325

CLINICAL DATA

A Test of Trolene in Britain 329
Treating Lungworms Successfully 330
Water Intoxication 330
Staining Polymorphonuclear Leukocytes in Urinary Sediment 330
Rabies Prophylaxis 335
Role of Brown Fat in Development of Bat Rabies 335
Detecting Glaucoma Early 335
A New Treatment for Glaucoma 335
Injudicious Use of Steroid-Containing Eye Drops 335
Fluorescent Markers of Antibiotics in Milk 335

NUTRITION

Enterotoxemia of Sheep 340
Polioencephalomalacia in Sheep 340

CURRENT LITERATURE

Abstracts

Serum Transaminase in White Muscle Disease 342
Resin-Agglutination Test for Vesicular Stomatitis 342
Effects of Stilbestrol on Calves 342
Electrocardiographic Studies in Dairy Cattle 342
Blood Calcium in Bovine Ketosis 342
Infectious Canine Hepatitis 343

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Correspondence

August 11, 1958

Dear Dr. Aitken:

Enclosed you will find a press release stating that the Hooper Foundation, of the University of California, has developed a medicated seed for feeding to parakeets. This seed has incorporated in it the antibiotic chlortetracycline which, the article states, when fed will help control psittacosis, pneumonia, bronchitis, and rhinitis in these birds. This medicated seed has been endorsed by the Chief Veterinarian of the Public Health Service. The article further states that this product would make the treatment and prevention of disease in parakeets inexpensive.

We disagree completely with many statements in the article. The continuous chlortetracycline therapy would tend to produce more resistant organisms, and then, when the sick bird is treated by a veterinarian, treatment will need to be of longer duration and more expensive if the desired results are to be achieved.

This article states that antibiotic solutions in drinking water are often useless because of differences in consumption by the individual birds. How about the appetite of the birds? Will all birds eat the required amount of medicated seeds daily?

In our practice we find that the average bird owner, in raising and caring for pet birds, uses directions obtained from feed boxes and from pamphlets which are distributed by the different seed companies in order to stimulate sales of the various products manufactured by them. The principles of sanitation, environmental temperature control, and proper feeding and care, which would reduce the resistance of the birds, are often ignored.

When a sick bird is presented to us for examination and treatment, the owner has usually already followed the directions of some feed company and pet shop owner and has tried five or six "remedies." We usually obtain quick and desired results by injecting the indicated antibiotic. We also find that when the antibiotic is dispensed for use in the drinking water, less than 2 per cent of the bird owners report that the birds will not drink voluntarily. If the bird does not drink the treated water, an accurate and correct dosage can be administered with a medicine dropper, which is far more effective than either the medicated seed or the medicated drinking water methods.

Articles such as this may convince pet owners that the proper way of keeping any animal free of disease is by using medicated feed and seed. Perhaps we should all give up our practices and buy feed stores.

Sincerely,
s/JAMES G. GREENE
JOHN N. TUTTLE
Passaic, N. J.

CONTENTS—Continued

Books and Reports

The Alimentary Tract of the Ruminant 343
Veterinary Drug Encyclopedia and Therapeutic Index 343
Listeriosis (Listeriosen) 343
Plants Poisonous to Livestock in the Western States 343
Bibliography of Avian Mycosis 343

THE NEWS

Eighty-Sixth Annual Meeting of the American Public Health Association 344
American Public Health Association Creates Five New Staff Positions .. 344
Courses at Communicable Disease Center Offered During 1958-1959 ... 344
General Research Training Grants Program 345
Armed Forces Institute of Pathology to Hold Postgraduate Course for Fifth Year 345
Colonel Mohri Awarded the Legion of Merit 345
Wanted by FBI—Man Masquerading as Veterinarian 345
Among the States and Provinces 346
State Board Examinations 351
Deaths 351

MISCELLANEOUS

Brucellosis in Man 311
Epinephrine Affects Agglutination Test for Brucellosis Test in Man 311
Treatment of Undulant Fever in Man . 311
New and Longer-Acting Sulfonamides 311
Treatment of Leptospirosis 315
Leptospiras in Aborted Fetuses 315
Inhibition of Anaplasma Marginale Infection with Oxytetracycline Hydrochloride 315
Confusion in Use of Tranquilizers ... 317
The Resistance of Coccidioides 317

ORGANIZATION SECTION

Student Chapter Activities .... adv. p. 27
Applications ..... adv. p. 27

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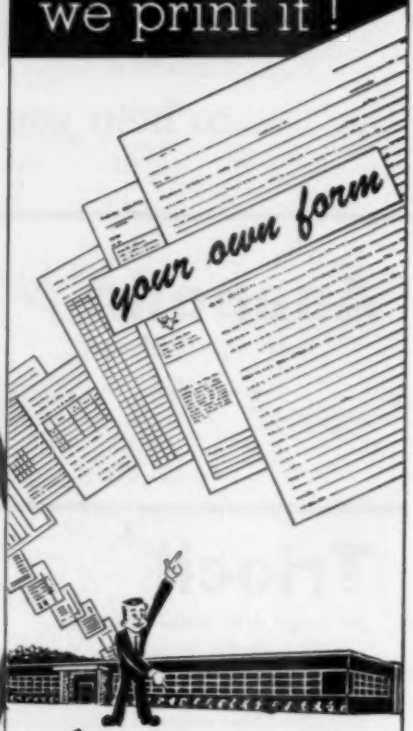

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Washington News

Military.—Defense Secretary McElroy reverses position taken by former Secretary Wilson regarding the Veterinary Services in the Armed Forces (see JOURNAL, June 1, p. 566, June 15, adv. p. 12, July 15, adv. p. 8, Aug. 15, adv. p. 8, all 1956 issues; Jan. 15, 1957, adv. p. 10, May 15, 1957, adv. p. 16). President Armistead announced the long-awaited verdict on Aug. 20, 1958, at the Ninety-Fifth Annual Meeting in Philadelphia, that notification had been received that the **Army Veterinary Corps and the Air Force Veterinary Service will be retained** and will continue their missions and functions substantially as at present. The Honorable Carl Vinson, chairman, House Armed Services Committee, was informed of the decision made by Secretary McElroy in a letter from Brig. Gen. C. G. Dodge, Acting Chief of Legislative Liaison, Department of Army. He also was advised that appointments in the regular Army Veterinary Corps, held in abeyance, will be made at an early date; some nominations will probably be announced in September, 1958.

The Army Veterinary Corps has a limited number of vacancies in grade of first lieutenant. Veterinarians desiring appointment and two years active duty should apply to the Army Area Headquarters (area in which they reside) for application forms and instructions. Information may be obtained also by writing to Veterinary Division, Office of the Surgeon General, Main Navy Building, Washington 25, D. C.

* * * *

Legislative.—Bills cleared for approval of the President: **Humane Slaughter Methods** (H.R. 8308); provide further protection against livestock diseases (H.R. 12126, see JOURNAL, Aug. 15, 1958, adv. p. 16); Supplemental Appropriations, fiscal 1959; (H.R. 13450), included $1,750,000 for meat inspection (see JOURNAL, Aug. 15, 1958, adv. p. 16), also $3,500,000 added for Plant, Animal Disease, and Pest Control.

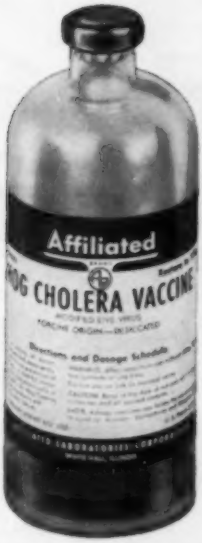
Title VII Public Health Service Act, amended (H.R.12876), authorizes another $90,000,000—over three year period—in federal program of dollar-matching grants for construction of health research facilities. Grants for construction of medical and dental school classrooms (multipurpose facilities) was eliminated in committee prior to House action (see JOURNAL, May 15, 1958, adv. p. 8, and July 15, 1958, adv. p. 12).

Social Security Amendments of 1958 (H.R. 13549); Federal Food, Drug, and Cosmetic Act, amended (H.R. 13254), to prohibit use in food of additives not adequately tested to establish safety; federal scholarship loans (H.R. 13247), to encourage and assist in expansion and improvement of educational programs to meet critical national needs; Reorganization Plan No. 1, of 1958, amended, (S. 4059), to change name "Office of Defense and Civilian Mobilization" to "Office Civil and Defense Mobilization" (see JOURNAL, May 15, 1958, adv. p. 8, and July 15, 1958, adv. p. 12); to transfer to Federal Trade Commission certain jurisdiction now exercised by the Secretary of Agriculture over meat packers (H.R. 9020); to provide for registration, reporting, and disclosure of employee and benefit pension plans (S. 2888).

Jenkins-Keogh (H.R. 10) tax deferment for self-employed passed by overwhelming vote in the House, July 29, but Senate Finance Committee, to which referred, failed to act on bill. Senator Potter (R., Mich.) endeavored to have it included as an amendment to tax bill being considered in the Senate on August 12. The amendment was defeated 52 to 32 on a technical issue.

* * * *

New Public Laws.—85-573, transportation foot-and-mouth disease virus; 85-574, inventory date anti-hog cholera serum; 85-582, studies on effects of insecticides, et cetera, upon fish and wildlife; 85-606, Department Defense Reorganization Act (see JOURNAL, Aug. 15, 1958, adv. p. 16); 85-580, Department Health Education and Welfare Appropriations, fiscal 1959.



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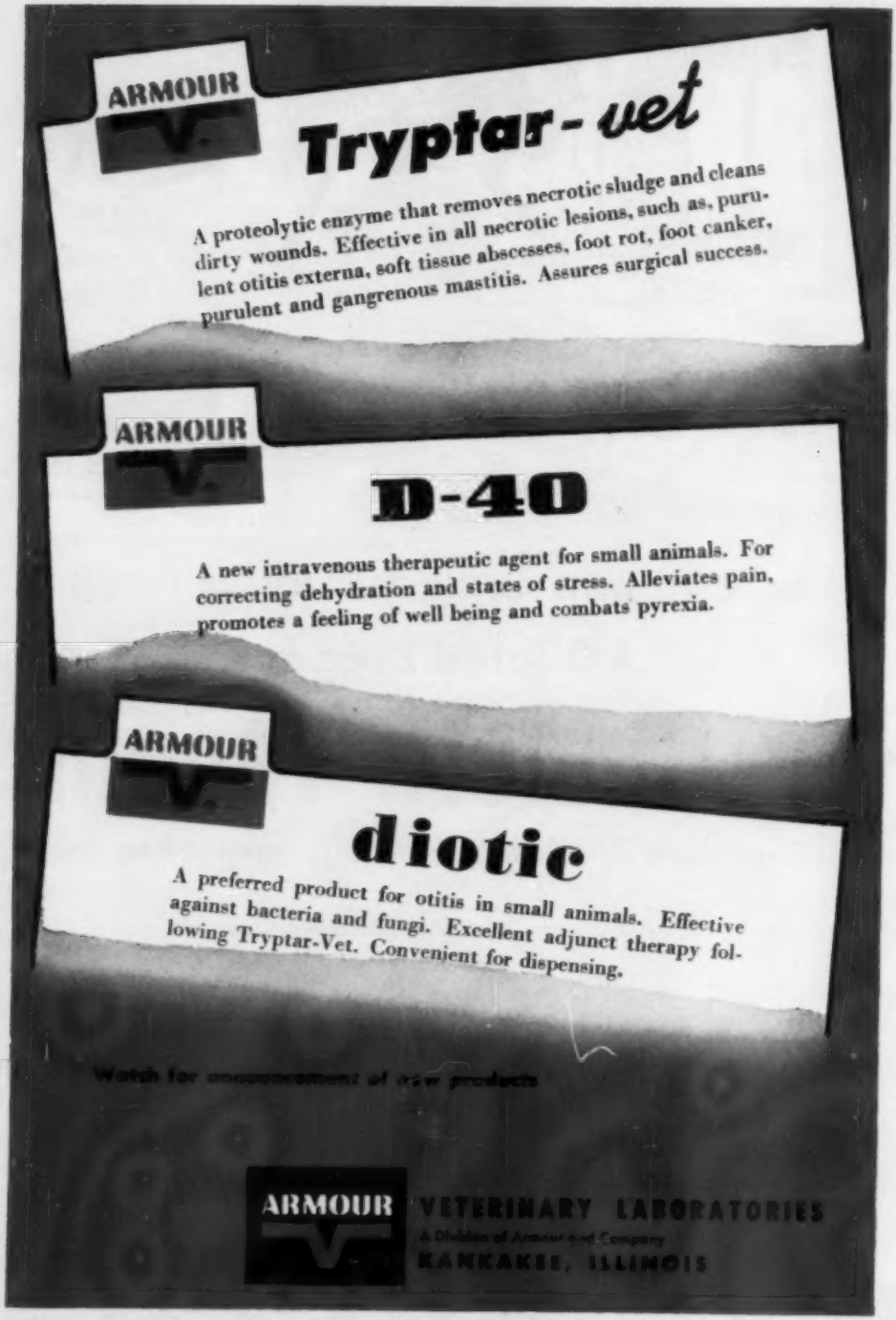
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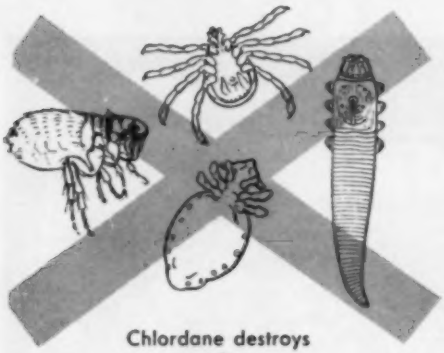

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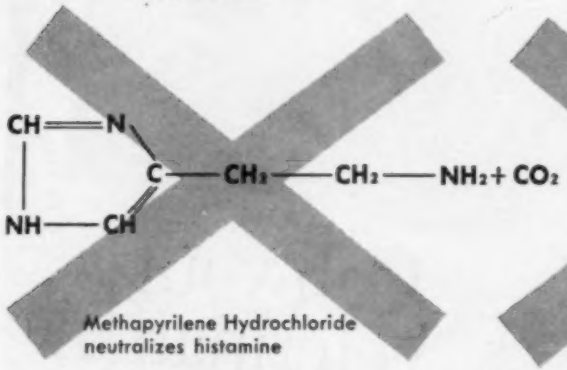

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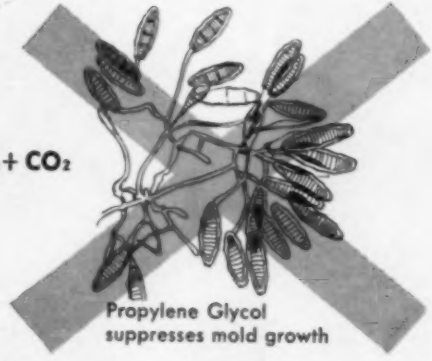

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1. Harris, J.R., and Clarkson, T.B., Prevention of Relapses in Milk Fever, Vet. Medicine, *12*:696 (Dec. 1955)

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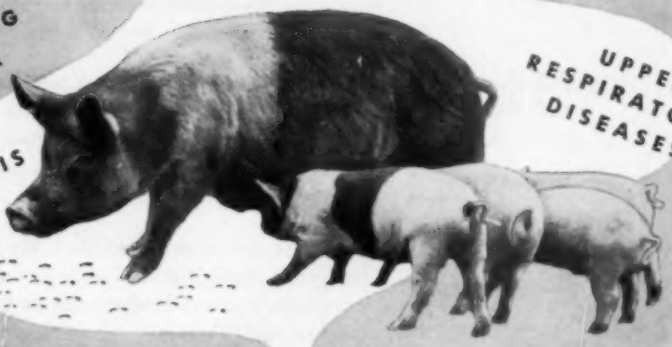

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Ammonium Chloride	40%
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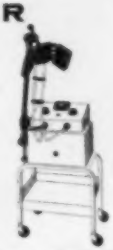

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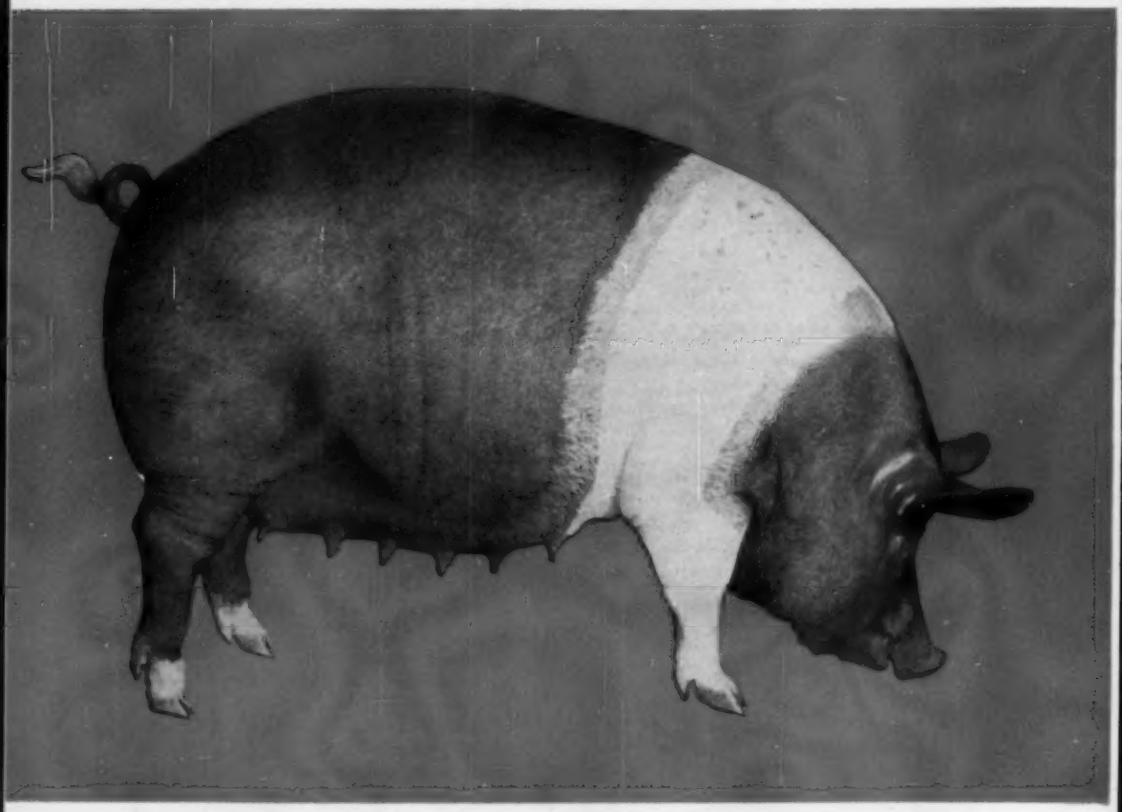

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Address of the President-Elect at the Philadelphia Meeting

R. E. REBRASSIER, D.V.M.
Columbus, Ohio

IT IS INDEED a pleasure to address this Ninety-Fifth Annual Assembly. It has been an exciting experience to serve as president-elect and I will do my best to meet the challenge of the presidency of the Association. I extend my appreciation to those who have worked on councils, committees, and special assignments. They have taken time from busy routines in order to contribute to the progress of the Association and the profession. I also express appreciation and thanks to all members of the local arrangement committees for their efforts in making this meeting one that follows the pattern for which our annual meetings are noted.

I acknowledge the fine contributions of the Women's Auxiliary. We are proud of this fast-growing organization, with its approximately 7,000 members. Someone has stated that the two dominant factors in creating good social and professional relations in veterinary medicine are the quality of service rendered by our members, and the activities of the auxiliaries. These activities, on a local, state, and national level, have exerted a great influence on the general public and are one of the important factors in the progress made in the field of social and professional relations.

The activities of the Womens' Auxiliary are many and varied and can not be detailed at this time, but several should be mentioned. Their program of awards, student news letter, loan fund, contributions to our research fund, and the work of the Public Relations Media committee are examples of the fine efforts of the members of the Auxiliary.

This address was delivered at the Ninety-Fifth Annual Meeting in Philadelphia, Aug. 18-21, 1958. In accordance with the new Constitution and Bylaws, the president-elect addresses the Opening Session of the annual meeting at which he is installed as president. Formerly, the president addressed the Opening Session.

It is provided in the new Constitution and Bylaws that the president-elect shall address the annual assembly at which he is installed as president. There are a number of areas in veterinary medicine that need careful study and eventual improvement, but I will discuss two areas that I consider to be of prime importance to progress in the veterinary medical profession, namely, education and professional relations.

Looking backward to the year 1761, when the first school of veterinary medicine was established at Lyons, France, and then appraising our profession as it is today, we can see the marked development and be proud that we are members of a fine profession. During this period, we have progressed from the art of restoring health to the science of diagnosis, prevention and

President-Elect R. E. Rebrassier

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control of disease and, in addition, are contributing greatly to the expanding field of public health.

While we have and are continuing to make progress, the change in trends makes it necessary to constantly study and readjust our policies and programs. No profession can become complacent and cease evaluating its strong and weak areas and attempt to adjust as the trends change.

EDUCATION

One of the major factors in the progress of veterinary medicine is the education and training of the veterinarian. In the early days, the art of veterinary medicine was performed by individuals with little fundamental training, while today the graduate enters the ranks with high school training, a minimum of two years' professional college work, and four years in an accredited school of veterinary medicine.

Much credit must be given to those who realized that, in order to provide adequate training in veterinary medicine, some system of supervision had to be established to assure minimum standards of education. The formation of the Council on Education made possible the accreditation of our schools on a basis comparable with those of medicine, dentistry, and pharmacy, and most of our schools have developed adequate programs as the trends of time demanded, but there will always be a need for improvement.

One of the areas that needs study is in the preparation for admission to schools of veterinary medicine. Dean Thorp, University of Minnesota, in an article entitled "The Practitioner's Potential Contribution to Education,"* explored the possibilities of improvement in high school preparation for our profession. His suggestions are timely, have potential value, and should be given earnest consideration by our educators.

In the two preprofessional college years, there should be more flexibility in the selection of courses. We now have a fixed pattern and assume that it will apply to each applicant. Experience has shown that students applying for admission to schools of veterinary medicine do not all fit into this fixed pattern, but need varied courses and individual advice as to their special needs.

*Mod. Vet. Pract., 39, (1958): 30-31.

The Opening Session of the Ninety-Fifth

Courses should be distributed among chemical, physical, biological, and agricultural sciences, with the addition of English, humanities, and social studies; an advisory system should be provided for individual students during the preparation period for admission to schools of veterinary medicine.

A major change is necessary in veterinary medical curriculums. Most areas of education are changing their programs from the traditional pattern to a system that will send out graduates who will carry into business and professional life the attributes of an educated person. The impression has long held that four years on a college campus will produce an educated individual. We fail to understand that college experience can only serve as an introduction to a business or profession and that true education must be a life-long process. Any human function that is not exercised is bound to atrophy and the function of the brain is no exception. The platitude that most of the "stop thinking at age 25" is meant for non-college people, but it also applies to many of our college alumni. All too often the new graduate, diploma in hand, heaves a sigh of relief and ceases all habits of studying, reading, or thinking. For all this, our colleges are largely to blame. We wrap our educational offerings in discreet packages: five hours per week for a certain number of weeks and then it is over. Our final examinations are, in fact, final for good and all.

The traditional pattern of our educational programs in veterinary medicine is to develop departments, each a closed area to other areas and each teaching material without regard to its application to the general field of veterinary medicine. This pattern has been fairly adequate when our students were trained to practice restoration of health in a private clinical practice, but it will no longer suffice in the broad training necessary for our ever-expanding activities. We must pattern our curriculums to prepare students to serve in any of the areas of the profession. With approximately 40 per cent of our graduates devoting their energies to nonclinical practice, we must teach more in terms of preventive medicine. More correlation of the various areas of teaching in an integrated program will enable the student to appreciate the application of each course to the general field of veterinary medicine.

Annual Meeting of the AVMA in Philadelphia

The Honorable Richardson Dilworth, Mayor of Philadelphia, welcoming the AVMA Convention to his city at the Opening Session.

It is especially pertinent at this time that we study our curriculums because of the far-reaching scientific and technological change in animal agriculture. As this change is developing, various methods are being explored to meet the challenge. One of these is vertical integration, which may occur by cooperative arrangements, contracts, or ownership. At the present time, some species of livestock are being produced under one of these plans and it is conceivable that this integration will expand into all species of livestock.

What will be the impact of vertical integration in animal agriculture on veterinary medicine? This is difficult to predict, but we should be exploring all possibilities just as the industry is doing. We can be certain that our service to animal agriculture will need to be more than curative medicine. This new program, which is based on profit, will demand services on a herd or flock basis, using the principles of preventive medicine, which will include management, breeding, nutrition, and preventive medication. There will need to be considerable adjustment in livestock practice and we should give serious thought to these problems and not wait until it is too late for the adjustment or until some nonprofessional organized function is established.

In order to develop an adequate educational program for the broad training of veterinary medical students, it will be necessary for all areas which utilize the services of the veterinarian to cooperate to keep pace with the changing trends. Close liaison should be established between the Council on Education, Association of American Deans, Agricultural Research Service, United States Public Health Service, and the military services.

PROFESSIONAL RELATIONS

The term "public relations" does not express, in the broadest scope, what we are trying to develop in our profession; "social and professional relations" would more nearly indicate our goal. Too often we think of public relations as a means of publicity or actual advertising, which is certainly not our basic objective. What we hope to accomplish is to demonstrate to all segments of the public that veterinary medicine is truly a medical science whose function is to serve them in various ways. We must develop the belief that we rank equally with other professions, especially those of medicine, dentistry, and law.

The two important segments of social and professional relations that I will discuss briefly are intraprofessional and interprofessional relations. There is a real need to improve relations within our own profession. These have been greatly improved over the early years but much remains to be accomplished to engender good feeling and true cooperation.

The organization of local associations has been a big factor in creating good will among veterinarians in a given area, and these associations should be aided and encouraged by our state and national associations in every possible manner. Local meetings enable the development of social as well as professional contacts, and many local problems are solved before they reach the higher levels. Many of these local associations have a women's auxiliary which is a powerful influence in developing good relationships. Probably this factor will do more to create good intraprofessional relations than any other, and it is hoped that this pattern will eventually be followed by all local associations.

Anything that will create good will and cooperation among veterinarians is vitally important because, unless we can show the general public that we are united in our

thinking and actions, efforts at the higher levels will not accomplish our objectives.

INTERPROFESSIONAL RELATIONS

This is an important facet of social and professional relations and one that has been, until recently, given little effort. Progress is now being made in this area and we are beginning to be accepted on the same level by the allied professiona. The councils on education of the national organizations of medicine, dentistry, veterinary medicine, and pharmacy meet semiannually to consider problems of mutual concern. Considerable benefit has been derived from these meetings in matters of education and mutual understanding.

The formation of interprofessional groups is gaining momentum and has been of value in removing the barriers of misunderstanding and creating a spirit of cooperation among the healing arts professions. Interchange of speakers on professional programs, as suggested by Past-President Kester, last year, is gradually being followed, and continued efforts should be made to expand this phase of interprofessional relations.

The past year has seen the development of symposiums on diseases transmissible from animals to man at which members from both medical and veterinary medical professions participated. Another development that is aiding these relations is the interchange of invitations to the social functions incident to medical, dental, and veterinary medical meetings. All these developments have tended to create good fellowship and understanding.

Dr. Mark Allam, general chairman of the Committee on Local Arrangements, making announcements at the Philadelphia Meeting.

It is to be hoped that this progress in intraprofessional and interprofessional relations will be continued and expanded as rapidly as possible. We must avoid the temptation to look backward to our accomplishments and assume a spirit of complacency. We must look forward, because the spirit of our profesion is one of progress toward greater accomplishments.

Distinguished Guests at AVMA Meeting in Philadelphia

Representatives from veterinary medical associations in North America and from across the sea attended the AVMA Ninety-Fifth Annual Meeting

Dr. James Henderson, president (left), Canadian V.M.A.; Dr. Jesus Estudillo, Mexican V.M.A.; and Dr. V. G. Cole, Australian V.M.A.

Dr. Mario V. Fernandes (left), Portugese V.M.A.; Dr. Shuichi Kure, Japanese V.M.A.; and Dr. F. G. Brown, British V.M.A.

President Armistead's Report to the House of Delegates

Following are extracts from President W. W. Armistead's address to the House of Delegates at their meeting in Philadelphia on August 15-16, preceding the Ninety-Fifth Annual Meeting of the AVMA. Presi-

President W. W. Armistead

dent Armistead summarized the progress made during the past year in regard to the 29 recommendations made by General Kester last year at Cleveland:

In commenting on the various recommendations, Dr. Armistead said:

1) A digest of the actions taken in the House will be made following the meeting for delegates to use when reporting to their constituent associations.

2) Emphasis is being placed on the economics of large animal practice through the work of the Committee on Veterinary Services, JOURNAL editorials, and this year's convention program.

3) AVMA public relations are being expanded — Distinguished guests from other professions and groups are invited to AVMA meetings; Youth groups have been, and are, contacted in PR program; AVMA members are being encouraged to participate in nonveterinary programs; and a study is being made of our present PR program.

4) All the progress outlined in this report was not accomplished during the past year—some of General Kester's 29 points were designed to give impetus to activities already underway.

New Constitution and Bylaws

President Armistead recommended that the new Constitution and Bylaws be approved at this meeting.

The Job Ahead

In looking at the job ahead, the president discussed the following points:

1) The radically and rapidly changing agricultural scene needs to be recognized;

2) Development of specialization in private large animal practice needs to be accepted and accelerated.

3) Education of the general public about aims, abilities, and importance of all veterinary medical endeavor needs to be intensified.

4) The student and new graduate need to be acquainted with their total obligation as professional citizens.

5) Practitioners need to accept the fact that there is a shortage of veterinarians and to welcome new graduates in their practice territory.

6) Local and state associations need to be strengthened.

7) More financial support is needed in research and education in general, veterinary research and education in particular:

> Russia has put a *larger* percentage of her smaller national income into public education than the United States. She made the rewards of intellectual accomplishment so attractive that her children are working their heads off to keep up with an extraordinarily tough curriculum . . . Russia has no teacher shortage, no substandard teachers—she has set their scholastic standard very high, given them a heavy work load; but she also honors them and pays them exceedingly well.

In conclusion, Dr. Armistead said:

The AVMA is a professional association, not a labor union. It is a fraternal society, not a police organization; a scientific body, not a 'pressure group.' Its primary purpose is to advance the cause of the profession in the public interest, not secure a monopoly for its members. Great harm can result from putting emphasis in the wrong places. Judgment, discretion, and tact are qualities which elevate the successful leader above the ineffectual fanatic. These same qualities can save us from alienating those whose support we need most.

Impact of Socioeconomic Conditions on the Practice of Medicine and Veterinary Medicine

JAMES Z. APPEL, M.D.

Lancaster, Pennsylvania

TO BE SELECTED to represent the American Medical Association before any audience is, in itself, as great an honor a doctor of medicine could desire. But when that audience is one of medicine's sister professions in the field of the healing arts, it is of much greater significance. Ladies and gentlemen, I am most grateful for this opportunity to bring greetings and best wishes from the American Medical Association to its teammate on the Health Team of the Nation, The American Veterinary Medical Association.

We wish to do more than just extend felicitations. It is our desire to publicly recognize the magnificent assistance in the advances made in human medicine through the basic research conducted by veterinarians in their own laboratories, in our medical laboratories, in pharmaceutical and in government laboratories. The outstanding job you have performed in the protection of the health of the nation in the fields of agriculture and dairy and meat inspection have long lacked the proper respect that is their due. The medical doctors of America must admit to the adoption for their purposes tools of therapy which you have developed in solving your problems in the treatment of small and large animals. These cover a wide field in medicine, from epidemiology, laboratory procedures, and drugs to methods and apparatus used in the treatment of fractures. For all this and much more, we of the American Medical Association are most appreciative.

For this same work, as well as for your performance in safeguarding the health of the people, your nation should be most thankful. Control, by you, of many of the diseases of animals which are transmitted to man has been most effective in the eradication of many human diseases. Your inspections and advice in the food, dairy, and meat industries have been just as effective in the realm of preventive medicine of humans as the vaccinations performed by members of my profession. And even in the production of our vaccines you have played your role. The public owes the veterinarians of the nation a huge debt of gratitude.

Dr. James Z. Appel

I could go on and on recounting your great accomplishments. I was not invited here to do that. I have said what I have said with a dual purpose in mind. First, I am sincere in my expressions of thanks and my efforts to give recognition to a great profession. Secondly, I wish to establish in the very beginning of this essay the similarity of purpose of the individual members of our two organizations. Because of this similarity of purpose, economic factors that are playing upon the world today have much the same effect upon our respective memberships. They present each of us with similar problems, similar frustrations, and indeed we must admit, similar benefits.

Our professions are made up of a "different breed of cats" than most other trades or professional groups. Because of our mutual historical background of dedication to our job, and our job is both an art and a science, we attract to our ranks a somewhat different, but in all a uniform,

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Dr. Appel is a general practitioner and surgeon. He is also a trustee of the American Medical Association.

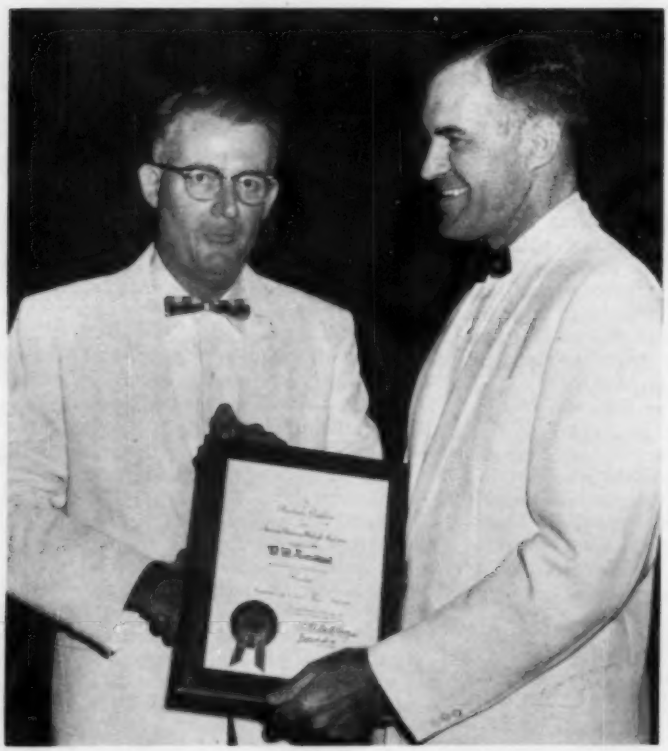
Presented at the Opening Session, Ninety-Fifth Annual Meeting of the American Veterinary Medical Association, Philadelphia, Pa., Aug. 18-21, 1958.

type of student. Our primary aim in life is service to others—in your case animals and humans, in my case humans.

Pecuniary gain is entirely secondary. I do not mean to infer we have no interest in a comfortable mode of life, maintenance of our health, and provision for the days when our ability to render service is impaired by illness or age. Of course we are interested in these things. But for these necessities of life we do not wish to expend as much energy in business details of procurement as other groups of society do. We prefer to conserve our energies for use in our work with man and animals. We have no desire for power or prestige that is dependent on wealth. If it is power or prestige we want, it is prestige for accomplishments in our professional work and power over the enemies of health.

Let us stop a moment to emphasize the word "service." The product of our work is entirely service—not material things. Some of our product is personal service rendered to an individual or to the servant or companion of an individual—animals. Some of our product is in the form of research. The result of such service, it is true, may be the production of a material product such as a new drug or vaccine, a new food for man or beast. But we are not interested in the merchandizing of such a product except that it be distributed freely and fairly to all who have need of it and at a fair cost. We have neither the interest nor the time to direct this distribution. Once a research problem has been solved, we only wish to return to the world of science to attack new problems.

Thus we are different from the employer class of society—the capitalist, the industrialist—call him what you may. On the other hand, our economic perspective is also different from the wage earner, the laborer, the unionist, the worker. Our differences here rest primarily in our dedication to our work. The chief inspiration to the wage earner is economic security—



Retiring President W. W. Armistead (right) receives the Service Scroll from Dr. L. M. Hutchings, chairman of the Executive Board.

a term that will be used in this discourse time and time again. He is not interested primarily in the quality of his performance on his job beyond the point at which quality of performance guarantees job security and, in some cases, elevation in job. Would his interest in the latter be shared by a larger number of his fellow workers there would be less need for the employment of professional negotiators to look out for his economic interest.

But why should he be dedicated to his job? His position in his industrial organization is like that of a cog on a gear of an automobile that transmits motion to the wheels but has no control as to where the wheels will take the automobile. There is little inspiration in an assembly line. His greatest inspiration arises from the fact that superior work might land him a more pleasant, less arduous job. Tenure and seniority insure his job and guarantee promotion, regardless of ability in many cases.

So you see, our professions are truly in the middle of the economic evolution through which the world is moving. I prefer the word "evolution" because the word "revolution" to my mind connotes actual combat. There is a conflict going on between classes of society, but no actual combat. It is not new, it is not of recent origin. It has been going on for centuries. As it progresses, the immediate objectives change. In the beginning, the objective was to give to the poor, to the wage earner, something he never had—economic security. To accomplish this the economic philosopher decried the inequality of the classes, denounced the rich and advocated taking from the rich and giving to the poor. This could be accomplished by force, by taxation, and by increasing wages, thereby taking a larger share of the profits that accrued to the manufacturer.

Since a sign of one's wealth was the amount of land an individual owned, the land or property tax was first seized upon by the reformers. But a land tax is limited in its aggregate return. The heavier land is taxed, the less it is desired and therefore the less it is worth. Many of the wealthier landowners divested themselves of their land and invested their wealth in securities. As this progressed, the graduated income tax was developed and became

Dr. R. E. Rebrassier (right) was installed as president of the AVMA by Chairman of the Executive Board L. M. Hutchings.

the weapon of the reformers in their war to destroy social inequality. The ultimate aim of the purist was that it should become actually confiscatory so far as the wealthy were concerned.

The wage earner was never completely sold on the idea of true equality. He merely wanted economic security—assurance that he would have adequate shelter, satisfactory clothing, and sufficient food for himself and his family. He was willing to work for this security provided his wages were sufficiently enlarged to guarantee it. His interest in the income tax was limited to assurance that it would not take from him such part of his wages that would leave him without security.

As progress was made in this direction and the wage earner acquired what he considered economic security, it became necessary to redefine what constitutes security. In other words, other conditions were added to food, clothing, and shelter as necessities of life or as rights of the individual citizen. Light, automobiles, entertainment, recreation, leisure, radios, televisions, and many other items were declared essential and the right of every citizen to enjoy. Thus, higher wages were demanded. To cover these increases, prices were raised and wages in turn to compensate for increased prices. The vicious spiral of wage increase followed by price increase led to the inevitable inflation.

Coinciding with this development of the economic life of the nation there was also developing an increasing need for services of a public nature: police and fire protection, education, sanitation, streets, roads, and national defense. These services can best be administered by government and, with the exception of the postal service, all are financed by taxation.

The Great Depression of the 1930's and its subsequent recovery period placed a greater demand upon the Government to provide services to the people. The provision of work itself was listed as a responsibility of Government. More moneys were required to finance these additional services, so up went the rate of tax upon incomes—especially in the higher brackets—never to come down again in any permanent and appreciable amount. Thus the personal and corporate income tax have be-

Dr. S. F. Scheidy (right) was installed as president-elect by Board Chairman L. M. Hutchings.

come the keystone of the tax structure of the federal government.

So far, the rate of taxation of personal or corporate income has not become confiscatory. But it has made it difficult for state and local governments to secure enough taxes to support their respective required services. Advocates for the principle that if government assistance is needed it is better administered at the state or local level have had a hard time providing sufficient funds at these levels through taxation. Some states or communities have adopted state or community income or wage taxes. This has met great opposition from the more conservative elements.

When such taxes are placed upon the rate of federal income they do become confiscatory. But the money is needed, so the conservatives have promoted the sales tax as the basic structure for financing state and local government. This type of tax does not meet with much approval from the socialistic reformers. On the other hand, they can not wholly oppose it since the wealthy, through their increased purchasing in quantity and quality, do actually pay a larger share of this tax than the poorer elements of society. Furthermore, by not depleting individual income to a greater extent, more money is left to the buying public to purchase products of manufacturing. The keystone of economy, as planned by the economic theorist today, is a high rate of production.

(Continued on p. 302)

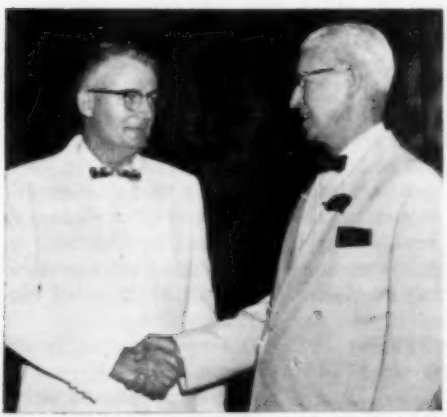
Dr. H. E. Kingman, Jr., Appointed Executive Secretary

The Executive Board announced the appointment, effective September 1, 1958, of Dr. H. E. Kingman, Jr., as AVMA executive secretary, succeeding Dr. J. G. Hardenbergh who had requested that he be relieved of that office at the conclusion of the 1958 annual meeting.

Dr. J. G. Hardenbergh (left), retiring executive secretary, congratulates Dr. H. E. Kingman, Jr., upon his appointment as executive secretary, to be effective Sept. 1, 1958.

Dr. Kingman has served as assistant executive secretary since September 1, 1953. Prior to that time, he had been treasurer for two years.

Dr. Hardenbergh will remain with the Association as "general consultant" and will also act as treasurer until his retirement which will be effective December 31, 1959.



Chairman Hutchings installs Dr. J. G. Hardenbergh (right) as treasurer for the coming year.

Dr. Forrest L. Hart (right), of Kansas, was installed as vice-president by Chairman Hutchings.

Secretary Benson Elected Honorary Member

By unanimous action of the Executive Board and House of Delegates at their business sessions preceding the convention, Secretary of Agriculture Ezra Taft Benson was made an Honorary Member of the

Secretary Ezra Taft Benson

AVMA. This was done in recognition of the Secretary's sincere interest in and effective support of veterinary medical affairs in the Department of Agriculture.

In considering his nomination, the Board and House noted Mr. Benson's support of and his Department's effective collaboration with the Mexican Government in eradicating and preventing the recurrence of foot-and-mouth disease in 1953-54, his endorsement of veterinary medical research in this and other foreign animal diseases as expressed at the dedication of the Plum Island Laboratory, the comprehensive plans for the National Animal Disease Laboratory at Ames, and other on-going programs related to veterinary medical science and services in the Department.

Professor Lerche Also Honored

By similar action, the Executive Board and House of Delegates elected Professor Dr. Martin Lerche, head of the department of food hygiene at the Veterinary College, Free University of Berlin, to honorary membership in recognition of his distinguished service to veterinary science, his contributions in the fields of veterinary public health, food hygiene, and poultry diseases.

These elections bring to 35 the roll of Honorary members of the AVMA.

(Continued from p. 301)

That group of society hardest hit by the income tax as it is presently constituted is not the wealthier groups nor the poorer groups. It is the group in between these two extremes, you and I. Exemptions and allowances such as long term capital gains, depreciation advance on oil wells etc. and loopholes recognized by astute lawyers permit appreciable savings to corporations and the wealthier group, not readily apparent to one who looks only at the rate schedules and not available to those with less assets.

On the other hand, the wage earner, regardless of his income, actually pays no tax on his income. His tax is paid before he receives any of his wages. It can be argued that such deductions are in lieu of wage increases. This is admitted. But that which one has never had is never missed when taken away. Personal responsibility is only brought home to a purchaser of a product or a service when he must reach into his own purse for the money.

Since the wage earner never has in his purse any of his income tax payments, he is not concerned with the amount or rate he is taxed. He is not too intensely interested as to whether his government spends his money carelessly or not. Further, if the rate is increased, it means little or nothing to him in as much as his union negotiators will simply negotiate at the next labor contract renewal for increase in total wage so that the "take home" pay is either not disturbed or increased.

Between these two classes of society lie the large middle class. Here the income tax hurts, and herein rests you and I. Our tax situation prior to the 1940's was tolerable. Our rates were not bad and our relative level of income was good. But as a result of the vicious spiral of wage raise followed by price rise, inflation has left us in a pretty difficult situation. Our devotion and almost total interest in our work more or less has caused us to be caught napping. Since the product of our labors is strictly a service, we had no tangible evidence such as automobiles, refrigerators, and television sets for which the public was willing to pay inflationary value.

Further, where labor was involved in our services, as in hospitals, pharmaceutical manufacturers' repeated increases in wages raised cost of hospitalization, of drugs etc. along with cost of all other products of

manufacturing. Cost of medical care does not separate drug cost, hospital cost, and physician cost, it is an over-all cost in the minds of the individuals who are ill. To keep it down, there was necessarily a slower increase in physicians' rates than in the general cost of living. Thus the tax rate on income for individuals in this middle group has risen faster, the value of the inflationary dollar has dropped faster than the rise in the gross income. This leaves less to spend to maintain the level of living to which the group is accustomed.

There are two alternatives to which the group can turn to correct this situation. The first is to exert strong political pressure to resist any increases in the tax increments of the middle range of incomes and further attempt to lower them. This procedure is almost impossible to accomplish but should be tried. The other alternative is an increase in our fees. This can be done but must be handled with care, less government control of our professions might be sought to counteract it.

Those of us who are in the fields of education, research, and governmental service are on salaries. They too should have increases in income. The rest of us who are on fee should support such increase in salaries. The incomes of members of this group have not done as well as in the private practitioner group. Their work is just as invaluable. If good men are to stay in these important fields or are to be attracted to them, salaries should be such as would hold and attract such men.

As the economic level of the wage earner improved, he became satisfied with his pay envelope to the extent that it took care of his present-day wants. The future was not his concern. So his leaders, through education, broadened the base as to what constitutes security. That taught him that true security entailed provision of insurance against periods of unemployment, retirement, and more recently health.

As a result, demands were made for employer-employee sponsored pension plans. Since unemployment compensation, pension plans of this sort are deductible items from the wage; they enjoy the status of also being deductible items from the income tax estimation. Their effect on the take home pay of the wage earner is nil for the same reasons discussed above in regard to income tax. Income tax on the amounts deducted for pension plans is not collected until the plan becomes operative for the individual. Thus the tax is actually deferred until the net taxable income of the individual is lower than at time of collection; thus tax paid is in a lower bracket.

Retiring president, Mrs. L. H. Moe, installs Mrs. E. A. Woelffer (right), incoming president.

You and I have no advantage similar to this. What we voluntarily invest in pension plans is taxable at the time of investment, that is, when our income is in a higher bracket. Your Association and mine are attempting to correct this inequity by securing the approval of Congress of legislation such as the Jenkins-Reed-Keogh bill.

Along this same line is the question of O.A.S.I., commonly called Social Security. Your profession is participating in the system despite your opposition to such inclusion. Mine has so far successfully remained remote from it. Here is a governmental plan that is actually unsound. It is not insurance, its premium—O.A.S.I. Tax does not cover its cost. All underwriting costs of the plan are paid out of the general tax fund of the Government. At present, the benefits of the aged are paid for by their children "unto the third and fourth generation." Participants in the system have no control upon the premiums paid nor of the benefits received. These controls rest with Congress. O.A.S.I. extension has become the greatest pre-election vote getting gimmick there exists today.

Finally, there is little chance of profes-

sional men as you and I ever realizing the benefits provided. If we survive long enough to be eligible for the benefits, we will still be able to continue the practice of our professions with an income derived therefrom above that stipulated to permit payment under O.A.S.I. This is the more likely, since Congress includes in the vote getting gimmick not only increase in size of benefit and unrealistic increase in tax to cover same, but also a lowering of the age of eligibility for benefits.

You know better than I do the impact on your income after taxes of the tax necessary to support the program. You already pay a surtax on the higher brackets of your net income for tax purposes. The O.A.S.I. is a surtax on the lower increments of your net income for tax purposes. Each election year that surtax will increase and the increment of your income taxed will advance until it meets and coincides with the increments of the higher bracket you are already paying a surtax.

Today the hue and cry is "your right to health." The objective of this propaganda campaign is fundamentally that some one other than yourself should pay your health bill. The individual is relieved of all financial responsibility for maintenance of his health or regaining health once it has been impaired. Let us stop here a moment and examine this tenet. Is it good for the individual to be relieved of all responsibility for his health? Health is a matter which, to a large extent, is governed by the behavior and actions of the individual. By his own doings he can preserve it or impair it. When there is no financial penalty for carelessness in behavior, inconvenience and discomfort become the only incentive for care. Witness the increase in automobile insurance costs in those states having compulsory automobile accident insurance laws.

On the other hand, there will also be a stimulation for over-utilization of health facilities, with resulting impairment of the efficiency of these facilities. This has been exemplified time and time again in those countries where socialized medicine exists. Even in our own nation under voluntary health insurance, either by insurance plans or by welfare funds, over-utilization of health facilities has caused increase in size of premiums, curtailment of services covered, or limitation of choice of physician to a small group whose services are the least costly.

The cost of total medical care is always underestimated. This is more true in government sponsored health care plans than in the private enterprise plans mentioned above. In government plans, if costs are underestimated, taxes must be increased or payments made to the providers of the

The House of Delegates in Session at the Philadelphia Meeting

services decreased. Congress will not cut the number of benefits already supported when maintenance in office depends upon votes.

Finally, it is my opinion that all these so-called "gifts from government" lower the moral fiber of our citizens. Unless we have some responsibility for our livelihood, we become weak, indolent, and lose incentive and ambition. Each one of us should be reminded time and time again of our share in the cost of the nation's economy. This must certainly include our responsibility in regard to our health. We do have responsibility to our government other than paying hidden taxes. It is our duty and privilege to defend it in time of war and to make it prosperous in times of peace. To accomplish this, it is our responsibility to maintain a sound mind and sound body. Thus from a moral point of view, from an ethical point of view, if from no other, we should be willing to pay for that sound mind and body.

We can not plan ahead as to the cost of our health and that of our family as we can plan our rent, clothes, and food. Some way should be provided for budgeting our health costs, not only to cover these costs incurred during our productive years but also during our years of anticipated retirement.

Insurance is the answer—insurance

(Continued on p. 306)

Convention Attendance—3,550

The "unofficial" total registration figure for the 1958 convention was 3,550; this includes veterinarians, their wives and children; also student chapter delegates and wives, exhibitor representatives, and special guests.

Although the attendance was below the all-time high of 3,715 (Minneapolis, 1955), there was, as expected, a record turn-out of children, mostly teens and subteens: More than 300 were on hand due in large part to the historical attractions of Philadelphia.

The customary breakdown of registration figures will be published in an early issue.

1961 and 1962 Convention Sites

The House of Delegates decided on the location of two more conventions. For 1961, official invitations had been received from the state and local V.M.A.s in Detroit, Mich., and Cincinnati, Ohio. The delegates selected Detroit.

For 1962, there were also two invitations: Miami Beach, Fla., and Dallas, Texas. Miami Beach was the winner.

By previous action, the House of Delegates had already set Kansas City, Mo., for 1959 and the Executive Board had set the dates: the week of August 23. This will be a Joint Pan American-AVMA meeting.

For 1960, the location is Denver and the dates are the week of August 14.

New Members of the Board of Governors

Dr. Dan J. Anderson (left), general practitioner of Smithfield, Texas, was elected chairman of the Executive Board and Dr. S. F. Scheidy, veterinary medical director, Smith, Kline and French, was chosen president-elect of the AVMA at the Ninety-Fifth Annual Meeting in Philadelphia in August.

(Continued from p. 305)

based on good actuarial standards, free of political control, free of the vote-getting gimmick. Such insurance should provide some form of policing to prevent over-utilization. This might entail co-insurance or deductible clauses. It might be of an indemnity type. I will admit of dangers of over charging in the latter type. To combat this, the medical profession should accept the responsibility of policing or surrender the right to fix fees.

Welfare plans have definite merit. They are relatively new and their administrators have much to learn. One thing they must learn is that the medical profession is the expert on what constitutes good medical care. No lay administrator can judge this merely by looking and comparing figures in a ledger. If the costs of good medical care, as judged by experts, causes a deficit in the plan's ledger and there is no over-charging or over-utilization, extent of coverage must be decreased or new sources of income for the plan must be discovered. Lowering of pay for services rendered will in the long run only cause deterioration in the quality of service rendered. The abuses of over-charging and over-utilization can be controlled if the administrators of the welfare plan and the medical profession will establish close and sincere liaison.

Veterinary and medical research have become tremendous not only in the range of subjects covered but also in their cost. Years ago this cost was assumed as the responsibility of industry and teaching institutions. The cost was paid out of profits realized in industry and by gifts to universities and colleges. With inflation, increasing taxation, less money today is left for this purpose. Therefore, government has entered the field. Government not only finances projects in established research centers but also builds its own research facilities. Thus taxes again must be raised to pay for this additional financial responsibility accepted by government.

There is nothing wrong with this procedure. The weakness lies in the selection of the field in which research is to be done. This is not only a weakness in government administration and financing of research, but also where such research is sponsored by voluntary health agencies. The direction in which government enters the research field is often determined by Congress. Lobbyist, pressure groups are used to influence Congress as to what fields of research the tax dollar should be applied. This advice is not always sound, it is often based more on emotional appeal than on actual need.

Your profession and mine should take the leadership in solving this problem. It should not be left to some uninformed lay organization or to government. Emotional appeal is fine for raising money. It has no place in the determination of a research problem or evaluating one research project against another. When Congress awards the U.S.P.H.S. unclassified funds for research, a good distribution usually follows. But too often Congress itself designates the field of study.

As a result of the economic spiral we have been talking about, the inflation, increase in taxation, and also as a result of increase in knowledge which leads in turn to increase in need for further study, the cost of veterinary and medical education has risen tremendously. Tuition sufficient to cover the cost of such education would be prohibitive for students or their parents to pay. On the other hand, for these same reasons the old time method of balancing the budget of schools by alumni giving is less and less successful.

Yet the education of our youth is most important. We need not only to educate more of these young people, but we must also educate them better. Low teaching salaries do not attract the best of teachers, even the thoroughly dedicated teachers. Research grants are of invaluable assistance. Government subsidization of teachers' salaries carries with it great danger of government control. This is a real threat to education. It can not be minimized. Back in the days of the Truman socialized medicine campaign, I pointed to the public school system of this nation as an example of governmental administration of a profession that left much to be desired. As a mass education media it is satisfactory if all we want is to have everyone in the nation educated to a minimal level. But as a system to pace education to the ability of the individual student, it is a failure.

Therefore, let us promote less and less of government administration and more and more and more of the private enterprise system.

Treatment of Chronic Copper Poisoning in Sheep

R. E. PIERSON, D.V.M., and W. A. AANES, D.V.M.

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CHRONIC COPPER poisoning in sheep is a highly fatal, noninfectious disease, characterized clinically by a normal temperature, icterus, and hemoglobinuria, and pathologically by enlarged, black-colored kidneys and liver. It occurs in sheep under a variety of conditions.[1,2]

REVIEW OF LITERATURE

Numerous cases of chronic copper poisoning have been reported following the continued ingestion of salt mixtures containing varying amounts of copper sulfate.[2,12] Orphan lambs have died from chronic copper poisoning[12] due to apparently accidental high copper content in the milk substitute.

The syndrome of chronic copper poisoning[3,9] has been recognized in sheep that have previously consumed the herbaceous plant *Heliotropium europaeum*. A hepatotoxic substance, possibly the alkaloid lasiocarpine which this plant contains, induces slow, progressive, pathological changes in the liver cells which favor the accumulation of copper. The sheep are rendered susceptible and, if given a diet which favors copper assimilation, they will store abnormal amounts of copper in the liver, which predisposes them to the development of chronic copper poisoning.

Another type of chronic copper poisoning affecting sheep is due to the variable balance of inorganic constituents (notably molybdenum, copper, and sulfate) in the plants.[9,13] The term "phytogenous chronic copper poisoning" is suggested for this type. Certain plants, such as subterranean clover, contain little or no molybdenum, but the copper content remains at the usual high normal values—15 to 20 p.p.m. The hemolytic crisis, produced by sheep grazing on these plants, is identical to that seen in typical chronic copper poisoning and is due to the imbalance of copper and molybdenum in the plants. This hypomolybdenosis allows a surplus of copper to be stored in the liver and copper toxicity to develop.

Chronic copper poisoning may be precipitated by a falling plane of nutrition, excessive exercise, or a sudden check of food intake as occurs in trans-shipment.[9] Loss of body weight is one of the principal factors in precipitating the hemolytic crises in sheep that have already built up a large storage of copper in the liver.[9] Thus, deaths may increase in number when pastures dry up, unless the loss of body weight is prevented by the use of supplementary feeding.

Sheep seem to be most susceptible to chronic copper poisoning when on certain ranges for the first time, and to gradually develop considerable resistance to the disease when kept on the same range for two or more seasons.[4]

During 1957, two serious outbreaks which occurred under different conditions were studied and are herein reported. Of particular interest is the dramatic way in which the disease responded to treatment.

HISTORY OF HERDS

Herd 1.—On Oct. 12, 1956, 1,500 7-year-old range ewes were moved from the Wind River country north of Rock Springs, Wyo., and turned out on pasture at Livermore, Colo. One month earlier, the client had purchased 30 rams from a breeder in Colorado and placed them in an adjoining pasture.

All sheep were handled under similar conditions. The ewes, in fair condition when purchased, soon gained in flesh when placed on the alfalfa and wheat pasture. When the pasture became short, the diet of the sheep was supplemented first with native hay consisting of timothy and clover and then with oat hay. A week later, losses began and increased at a steady rate.

On November 25, 2 ewes died suddenly and another was sick. Clinically, they showed a yellow discoloration of the mucous membranes, anorexia, weakness, hematuria, and hemoglobinuria. A diagnosis of chronic copper poisoning was made. Losses continued until December when treatment was started. None of the Colorado-raised rams showed any signs of illness although maintained under almost identical circumstances as the ewes, and for a longer period of time.

A thorough investigation of the management and environmental conditions where the ewes originated in Wyoming revealed no information as to possible source of the copper. The sheep had not been treated with vermifuges or with external copper, such as copper sulfate for disinfectant or foot rot treatment. However, it was later learned that some of the sheep in the flock of origin[16] had high levels of copper in the liver (540 and 426 p.p.m.). It was also determined that ovine anaplasmosis was present in the source flock.[17]

Chronic copper poisoning may have been

From the College of Veterinary Medicine, Colorado State University, Fort Collins.

TABLE 1—Results of Blood Examination of Three Sheep with Copper Poisoning

	Case 1	Case 2	Case 3
Hemoglobin (Gm./100 cc.)	.....	8	Less than 4
Erythrocytes	.....	.....	.....
Erythroblasts			
Normoblasts (No./100 w.b.c.)	.....	67	.....
Anisocytosis	Marked	.....	.....
Polychromatophilia	Marked	Marked	Moderate
Howell-Jolly bodies	.....	Few	Few
Leukocytes/cmm.	37,800	25,000	13,800
Monocytes/ 100 w.b.c	1	9	11
Neutrophil segments /100 w.b.c.	68	18	52
Immature neutrophils/100 w.b.c.	.....	.....	13
Lymphocytes/ 100 w.b.c.	31	69	23
Eosinophils/ 100 w.b.c	.....	4	1
Hematocrit (%)	.....	22	8
Blood urea nitrogen (mg./ 100 cc.)	250.0	140.2	345.8

due to a variable balance of copper and molybdenum in the plants consumed in Wyoming. The falling plane of nutrition probably was the predisposing factor which precipitated the hemolytic crisis.

Treatment during the first week consisted of spraying the oat hay daily with 75 Gm. of ammonium molybdate (50 mg. per head) plus 5 lb. of sodium sulfate in each 5 gallons of water. The following two weeks, 60 Gm. of ammonium molybdate (40 mg. per head) was mixed with 5 lb. of sodium sulfate and sprayed on the hay each day.

Ninety ewes had died from chronic copper poisoning before treatment was started. Within 48 hours after commencing treatment, all losses stopped. After ten days, the owner decided to spray the hay only every other day and, within 48 hours, losses commenced and continued for several days (chart 1) until daily treatment was resumed. Ewes showing signs of chronic copper poisoning recovered on this treatment.

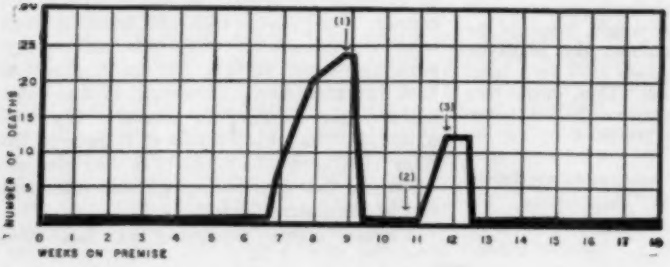
Liver assays from 4 ewes showed 369 to 433 p.p.m. of copper in the liver.

Herd 2.—On April 6, 1957, a yearling Corriedale ram was submitted to the clinic. He was recumbent and unable to move. The skin and mucous membranes were bright yellow and the urine was coffee colored. Blood samples were collected for laboratory examination (table 1). The ram was killed for necropsy. Generalized icterus was present. The liver was dark brown and the kidneys were black. Chemical analysis of the liver showed 356 p.p.m. of copper.

The tentative diagnosis was chronic copper poisoning and the owner was advised to treat the remainder of the animals in the herd with ammonium molybdate. The herd consisted of 750 purebred sheep, including 119 yearling rams, 20 2-year-old rams, and 10 aged rams. Forty of the yearling rams had died. Although all of the rams were on the same feed, none of the older rams were affected. Death occurred about 24 hours after the first sign of illness.

These rams, bred on a ranch near Golden, Colo., had been pastured on the continental divide above Tolland, Colo., until they were weaned in late August and trucked to the home ranch. They were then fed alfalfa hay, free choice, and a grain mixture consisting of 80 per cent brewers' pellets; the remaining 20 per cent was milo, oats, and molasses. Later in the feeding period, the brewers' pellets were reduced to 35 per cent of the concentrate. The concentrate was started at the rate of ¼ lb. and gradually increased to 2 lb. per head per day. Common salt No. 4 was fed free choice. The rams in this herd were given no other mineral supplement and had never been wormed.

Although the losses had occurred only in the yearling rams, before conditions were corrected, a few 2-year-old rams died and, later, 2 aged rams died. The owner



Graph 1—Results of molybdenum treatment of sheep with chronic copper poisoning. Sheep 1 and 3 were fed molybdenum daily; sheep 2, on alternate days.

observed that those involved were always in the best condition; none of the small or undersized individuals were affected.

The treatment recommended was to spray the hay with ammonium molybdate at the rate of 50 mg. per head per day. Sodium sulfate was not recommended at this time since the sheep were being fed alfalfa hay.

Losses continued, so 2 more rams were examined. Chemical analyses of their livers showed 390 and 430 p.p.m. of copper, compared to 15 to 21 p.p.m. for 2 controls. The necropsy findings were those of chronic copper poisoning.

The dosage of ammonium molybdate was then raised to 100 mg. per head per day and sodium sulfate was added to the treatment. One ram died three days later but no further losses occurred.

PATHOGENESIS

Once absorbed, copper is excreted relatively slowly by the animal. Marston[12] states:

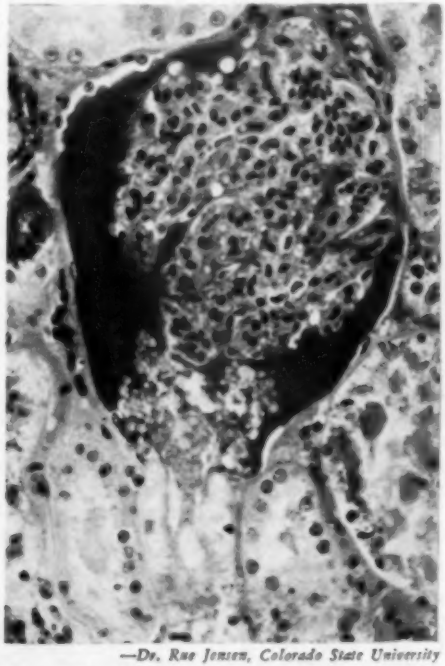
> In those circumstances and depending on the nature of the forage, the concentration of copper in the liver of the sheep increases rapidly to high levels, ten to 20 times the normal range without any untoward physiological effects until, for some unknown reason, a large amount of it is liberated catastrophically in the blood stream. Extensive hemolysis then ensues, the animal becomes jaundiced and usually succumbs.

In the above circumstances, due to the extensive hemolysis, an obvious hemoglobinuria was present. The enlarged black kidneys found at necropsy (fig. 1) and the histopathological evidence of occlusion of the uriniferous tubules with hemoglobin derivatives (fig. 2) indicate impaired kidney function as the immediate cause of death.

According to other investigations,[7,8] the high concentration of copper in the liver produces a slow and progressive destruction of liver cells. It interferes with their normal metabolism and the cells are unable to play their part in the metabolism of fat. As a result of liver damage, the animals may develop some jaundice and die from general metabolic dysfunction.

—Dr. Rue Jensen, Colorado State University

Fig. 1—Cut surface of a kidney from a sheep affected with chronic copper poisoning. The cortex and medulla are darkened. x 0.66.



—Dr. Rue Jensen, Colorado State University

Fig. 2—Glomerulus from kidney of a sheep affected with chronic copper poisoning. Glomerular filtrate contains hemoglobin and protein. Globules of protein are entering the tubule. H & E stain; x 236.

TREATMENT

It is reported[10] that there is no treatment for chronic copper poisoning because the animal dies within a day or two after it shows the characteristic signs of poisoning, and that copper is eliminated slowly from the body so animals in the herd may continue to die from copper poisoning for five months after the source of copper has been removed.

A nutritional inter-relationship between copper and molybdenum has been known for some time. Copper reserves in the livers of sheep and cattle may be depleted by dosing the animals with molybdate.[12] Under certain circumstances, molybdenum can complicate the metabolism of copper, and there is no doubt that sheep may ingest relatively large amounts of molybdenum for long periods without showing signs of copper deficiency, although the copper concentration in their livers may become materially reduced.

An absence of molybdenum in the diet of sheep will result in a rapid accumulation of copper in the liver, while an excess of molybdenum will cause a copper deficiency; 0.5 mg. of molybdenum per day will significantly limit copper storage.[6]

Storage of copper in the livers of sheep is prevented by the inclusion of only a few milligrams of molybdenum per head daily in an alfalfa hay diet. The same amount of molybdenum, when added to a diet of oat hay, had no effect in limiting storage of copper in the liver. It was determined that the factor in alfalfa which suppressed molybdenum in the circulation was inorganic sulfate. It was found that inorganic sulfate, together with molybdenum, was responsible for the prevention of copper storage in the liver.[5]

Phytogenous chronic copper poisoning can be controlled by using medicated salt licks as follows:[9] mix a bag (187 lb.) of common coarse salt and a bag (140 lb.) of finely ground gypsum (calcium sulfate) and add, by spraying or sprinkling, 2 gallons of water containing 1 lb. of sodium molybdate.

DISCUSSION

The history of the first herd with chronic copper poisoning indicates that the cause may have been an imbalance of copper and molybdenum in the pasture plants where the sheep originated in Wyoming. The falling plane of nutrition and other stress factors associated with winter are thought to be the predisposing factors which precipitated the hemolytic crises. It is suggested that this type of chronic copper poisoning be called "phytogenous chronic copper poisoning."

The chronic copper poisoning in the second instance was due to a different cause. An analysis of the grain pellets, sold commercially by a brewery firm as a by-product of their brewing process, revealed that the pellets contained 50 parts per million of copper. These pellets were fed to the rams in an unusually high percentage of the grain ration and, since chronic copper poisoning seems to be a cumulative process, it is believed that the brewers' grain pellets were the source of the copper in this instance of chronic copper poisoning.

In both instances, the sheep responded immediately to treatment with ammonium molybdate and sodium sulfate. When ammonium molybdate was given to the ewes every other day, rather than daily as recommended, deaths due to chronic copper poisoning occurred again. This might indicate that the dose of ammonium molybdate used was a minimum dose and should be increased.

In the second outbreak, the ram losses continued until the dosage of ammonium molybdate, given with sodium sulfate, was increased from 50 to 100 mg. per head daily. Within 72 hours, the losses stopped and no new cases developed.

SUMMARY AND CONCLUSIONS

Chronic copper poisoning in two herds of sheep is described. The cause of poisoning in the first herd is thought to have been phytogenous in nature; the second is thought to have been due to the high copper content of a brewers' grain pellet which was fed in large amounts for several months. Losses were heavy in both instances until ammonium molybdate and sodium sulfate were added to the diet, but stopped within 72 hours following this treatment.

A dose of 50 to 100 mg. of ammonium molybdate per head, daily for three weeks, when combined with sodium sulfate (5 to 15 grains per day) stopped losses from chronic copper poisoning in sheep. The daily calculated dose of ammonium molyb-

date was mixed with a quantity of water and sprayed on the hay.

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Brucellosis in Man.—Three types of skin reactions are recognized in veterinarians, in Germany, after contact with Brucella-infected cattle, mainly while aiding in parturition or while removing fetal membranes. Erythema with urticaria, of short duration, may occur on the arm soon after such contact; a nodular eruption may commence one to three days after contact; or a regional lymphadenitis may result from infection through small skin wounds.—*Vet. Bull. (May, 1958): Item 1368.*

Epinephrine Affects Agglutination Test for Brucellosis in Man.—Epinephrine often produces an increase in the value of the Wright agglutination test or elicits a positive reaction from a previously negative agglutination test. A patient with the chronic form of brucellosis was given epinephrine intravenously (1/50 mg. daily) for several weeks. The agglutinin titer rose from 1:320 to 1:1,280 five minutes after the injection but, after several days of such treatment, the agglutinin titer remained at 1:320 both before and after the injection of epinephrine. All signs and symptoms of brucellosis had disappeared at the termination of the therapy. (The author does not indicate whether antibiotics were used concurrently with epinephrine.)—*J.Am.M.A. (June 21, 1958): 1034.*

Treatment of Undulant Fever in Man.—The new antibiotic, cathomycin, was used to treat undulant fever in 26 patients, all of whom responded without a relapse. Of the 26 patients, 20 had positive blood cultures on admission and the remaining six had positive agglutination tests.

Treatments were started when the disease was considered to be at its height. During the first five days, no change was apparent, but almost always on the fifth day the pyrexia resolved by crisis and all signs and symptoms disappeared. By the end of the treatment, the spleen had returned to its normal size and shape.

The usual dose for adults was 0.25 Gm. every four hours until the day after crisis and then every six hours to a total of 18 Gm.—*J. G. Gost in Lancet (Jan. 25, 1958): 191 (abstr. in J.Am.M.A., May 10, 1958: 253).*

Longer-Acting Sulfonamides

The use of antibiotics against urinary infections and colibacillosis has not been highly successful and sulfonamides have had to be administered orally at frequent intervals. The new long-acting sulfonamides, sulfametoxypyridazin and sulfophenylpyrazol, can be given infrequently and in small doses. Both are well absorbed from the intestinal tract, slowly eliminated by the kidneys, highly soluble in urine, and easily diffusible in the body fluids.

Their bacteriostatic activity is superior to that of other sulfonamides. Analysis shows that high levels of the drug are obtained in such body fluids as blood, bile, pleural fluid, ascitic fluid, and cerebrospinal fluid. These sulfonamides also have the advantage of not provoking modifications in the saprophytic flora.—*J.Am.M.A. (July 12, 1958): 1440.*

Anaplasmosis and Concurrent Copper Intoxication in Sheep

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OVINE ANAPLASMOSIS has been recognized in the United States, only in Kansas, in sheep originating from Colorado, Wyoming, and Montana.[17,18] It has also been suspected in sheep in Utah.[9] Ovine anaplasmosis is usually subclinical, but well-marked anemia may develop.[8] Heavy parasitism, malnutrition, debilitating diseases, and increased susceptibility may predispose to acute anaplasmosis.[18]

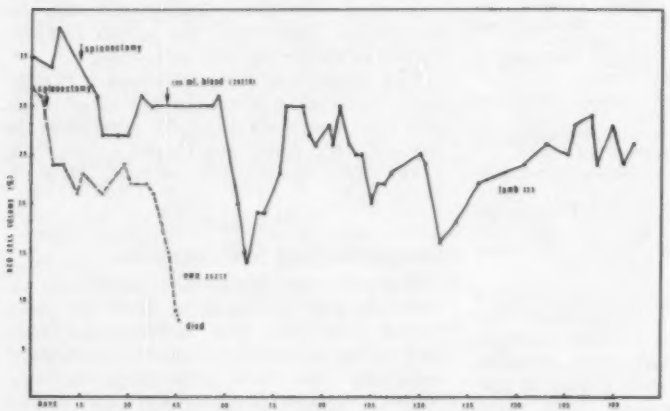
Acute copper poisoning in sheep frequently is associated with improper use of copper sulfate drenches; chronic copper poisoning has been connected with employment of copper sulfate in salt mixtures[3,12] Chronic copper poisoning is marked by generalized icterus, hemoglobinuria and hematuria, inappetence, and weakness.[3]

damage of the liver cells from ingestion of toxic plants, such as heliotrope.[3,4]

Copper levels of 120 p.p.m. in livers and 5 p.p.m. in kidneys are considered normal in sheep.[5-7] However, there is considerable variation, and there is a gradual increase with increasing age.[5] The amount of copper to be expected in clinical and subclinical copper poisoning has been discussed,[12] and findings of over 500 p.p.m. of copper in fresh liver,[11] and 1,000 p.p.m. on a dry basis,[10] have been considered indicative of poisoning.

CLINICAL HISTORY

In the fall of 1956, 1,500 aged ewes, shipped from Wyoming to Colorado, remained in good condition while on alfalfa



Graph I—Effect of inoculation of blood from a sheep with anaplasmosis into a splenectomized lamb, and effect of splenectomy on a ewe suspected of having anaplasmosis.

Abnormal intake of copper salts, leading to high storage of copper in the liver followed by sudden release into the blood stream, with red cell destruction, icterus, hemoglobinuria, and kidney damage, has been observed in sheep in Australia[2,15] and South Africa.[16] This has been attributed to

pasture. Six weeks later when pasture became short and feed conditions were changed, approximately 90 (6%) died in about a month. Coffee-colored urine, icterus, and depression were observed in 10 per cent of the sheep, and 350 to 400 p.p.m. of copper was detected in the livers at necropsy. Heavy intestinal parasitism was also observed.

When ammonium molybdate and sodium sulfate were given as a copper poisoning antidote, losses stopped in 48 hours. When

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treatment was reduced to every other day, deaths recurred until daily treatment was reinstated.[13,14]

When the source of these sheep was investigated, it was found that no abnormal losses had occurred in the original band in Wyoming, nor was there any obvious source of excessive copper. At necropsy of 2 Wyoming ewes in poor condition, extensive infection with *Cysticercus tenuicollis*, *Thysanosoma actinioides*, and *Moniezia expansa* was found, complicated by pneumonia in 1 ewe. Seven additional Wyoming sheep were secured for further study. Their condition varied from poor to good.

PROCEDURE

Two of these 7 Wyoming sheep, because of their poor condition, were killed and examined immediately. Blood studies (total erythrocyte and leukocyte counts, erythrocyte volume, hemoglobin, icterus index, and Giemsa-stained smear examinations) were continued on the others. Two were subjected to splenectomy, and the blood of 3 others was used for inoculation of splenectomized lambs. As the original sheep and the inoculated ones died or were killed, liver and kidney specimens were analyzed for copper[1] and tissues were examined histologically.

TABLE I—Studies on Anaplasmosis and Copper Intoxication in Wyoming Sheep

Original Sheep	Experimental work	Disposition*	Anaplasmosis status	Copper (p.p.m.)** Liver		Kidney	
				Fresh	Dry	Fresh	Dry
26272-old, poor condition	.....	K-2 da.	Bodies detected	426	2,069	150	776
26273-old, poor condition	.....	K-2 da.	Bodies detected	540	2,005	48	261
26274-old, fair condition	Splenectomized	Alive	Bodies detected early Characteristic course	.....	.....	.....	.....
26275-lamb, fair condition		K-3 mo.	Bodies detected	96	314	16	219
	100 ml. blood to splenectomized lamb 328	K-4 mo.	Characteristic course	80	283	3	16
	100 ml. blood from lamb 328 to splenectomized calf 345	Alive	No change	.....	.....	.....	.....
26276-aged, good condition		K-1½ mo.	Bodies detected	356	1,166	58	266
	75 ml. blood to splenectomized lamb 2	Alive	Characteristic course	.....	.....	.....	.....
	100 ml. blood from lamb 2 to lamb 1	D-16 da.	Characteristic course	96	509	23	142
	100 ml. blood from lamb 2 to adult 193	K-4 mo.	Characteristic course	101	348	3	14
	100 ml. blood from lamb 2 to adult 197	K-4 mo.	Characteristic course	82	281	3	9
	100 ml. blood from lamb 2 to splenectomized lamb 326	D-18 da.	Characteristic course	39	147	7	34
	100 ml. blood from lamb 2 to splenectomized lamb 327	D-18 da.	Characteristic course	43	167	4	18
	100 ml. blood from lamb 2 to lamb 345	K-1 mo.	Characteristic course	13	44	3	12
	100 ml. blood from lamb 2 to lamb 346	K-1 mo.	Characteristic course	57	195	4	16
26277-aged, fair condition	Splenectomized	D-4 mo.	Bodies not detected until splenectomized	102	426	3	15
26278-aged, fair condition		K-3 mo.	Bodies detected	264	994	29	140
	100 ml. blood to splenectomized lamb 325	K-4 mo.	Characteristic course	75	328	4	14
	Old ewe - no exposure to copper or anaplasmosis	.....	.....	318	1,075	38	191
	Average of 6, 3-yr.-old pregnant ewes	.....	.....	207	718	17	82

*Disposition: K = killed; D = died; interval after receipt or inoculation; **copper levels expressed in the commonly used fresh weight basis and also the more accurate dry weight basis.

RESULTS

The outstanding findings from the 7 sheep and from those inoculated with their blood are summarized (table 1). Changes in the blood following splenectomy and the typical changes following inoculation of a splenectomized lamb are shown (graph 1). One of the 2 ewes killed showed emaciation, intermandibular edema, and hematuria.

The other one also was emaciated, with extensive pneumonia and pleuritis, increased pericardial fluid, hepatic cirrhosis with biliary calculi, and swollen kidneys with extensive degeneration. Sections of her kidneys showed large, cellular glomeruli with prominent capsules, frequent hyaline casts, dilated tubules, blood pigment within the tubules, and a thickened renal capsule.

In these, and in sheep killed later, there were variable numbers of fringed and broad tapeworms and *C. tenuicollis*, but relatively few pathological changes.

Anaplasma-like bodies were found in early smears in the red blood cells of 6 of the original 7 sheep. Following splenectomy of 2 of these sheep, there were marked declines in their red blood cell counts and volumes, and parasitized cells were abundant. In 1 of these 2 sheep, the red blood cell volume declined rapidly, following splenectomy, to a low of 8 per cent when death occurred.

Inoculations of blood from these sheep into splenectomized and intact sheep also resulted in the typical drop in circulating red blood cells and development of Anaplasma-parasitized cells.

DISCUSSION

The clinical signs, lesions, copper levels detected, and response to molybdenum therapy all indicated that copper poisoning was the cause of losses in the exported sheep. No untoward losses occurred in the original band of sheep; however, in 7 of those that were secured for diagnostic study, anaplasmosis was demonstrated by finding Anaplasma bodies, by splenectomy, and by inoculation of splenectomized and intact sheep.

The livers and kidneys of the 7 sheep secured for study contained widely varying amounts of copper (96-540 p.p.m. on fresh liver basis). The 2 ewes killed immediately when secured had the highest levels of liver copper (540 and 426 p.p.m.); the others had decreasing amounts (356 to 96 p.p.m.), with the smallest amount detected in the lamb.

An aged ewe held at the laboratory without exposure to copper, and presumably without exposure to anaplasmosis, also had appreciable amounts (318 p.p.m.) of copper in the liver (table 1). Analysis of the organs of 6 healthy, 3-year-old, pregnant ewes from a different owner, but from the same general area, revealed an average of 207 and 17 p.p.m. of copper in liver and kidney tissue, respectively (table 1).

Under certain conditions, especially with increasing age, appreciable levels of copper might be carried by apparently normal sheep. Then, perhaps, when latent anaplasmosis flared up due to the stress of intestinal parasitism and change in feed, the resulting hemolytic anemia could further elevate the copper levels to the point where signs of copper poisoning would appear.

However, the comparatively low levels of liver copper observed in the sheep (primarily lambs) experimentally inoculated to demonstrate anaplasmosis does not substantiate this. That ovine anaplasmosis over a period of time might conceivably elevate the copper level in the liver also could not be demonstrated here because of the relatively short duration of the disease in these experimentally infected sheep.

SUMMARY

Following the occurrence of chronic copper poisoning in a group of sheep that had been shipped from Wyoming to Colorado, variable to high levels of copper were detected in a sampling of sheep from the source flock. Ovine anaplasmosis was also detected in these sheep by the demonstration of Anaplasma bodies and by the characteristic changes following splenectomy and inoculation of blood into experimental sheep.

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Treatment of Leptospirosis

Leptospirosis in man tends to take one of three forms: (1) a severe type with marked hepatorenal damage as in classical Weil's disease; (2) a type with meningeal irritation as in "swineherd's disease" caused by *Leptospira pomona*; and (3) a type characterized by abdominal disturbances, as is commonly found in *Leptospira grippotyphosa* infections. Except in the severe type, frank jaundice is not uncommon, but in all forms some degree of renal damage is usually noticed.

Leptospirosis is comparatively uncommon in Great Britain, where only *Leptospira icterohaemorrhagiae* and *Leptospira canicola* have been found.

Many patients have been treated with antibiotics but, except for penicillin, not enough to allow conclusions. Of 152 jaundiced persons with true Weil's disease treated with penicillin in England during 1947 to 1950, 22 per cent died as compared with 23 per cent of 103 similar persons not given the drug. Of 67 patients in Puerto Rico, about half of whom were infected with *L. icterohaemorrhagiae*, treament with various antibiotics was ineffective when compared with 12 controls.

However, when penicillin therapy on 84 soldiers was begun as soon as the clinical diagnosis of leptospirosis had been made, the pyrexial period was reduced, the patients quickly improved, and none died, indicating the need for early diagnosis and therapy.—*Brit. Med. J. (June 28, 1958): 1530.*

Inhibition of Anaplasma Marginale Infection with Oxytetracycline Hydrochloride.—Two of 11 heifers were positive to the complement-fixation test for anaplasmosis. Each was inoculated subcutaneously with blood from carriers of a strain of *Anaplasma marginale*. When blood samples began to show an increase in Anaplasma bodies, 6 of the heifers negative to the test were treated with oxytetracycline hydrochloride given intramuscularly at the rate of 3 mg./lb. of body weight daily for three days. Development of infections was promptly arrested.

Severe anaplasmosis occurred in 2 of the 3 control heifers, and mild anaplasmosis in the 2 heifers positive to the complement-fixation test.—*J. F. Christensen and J. B. Harrold in Proc. U.S. Livestock San. A. (Nov., 1956): 69.*

Leptospiras in Aborted Fetuses

During an epizootic of bovine leptospirosis due to *Leptospira pomona*, on a Danish island, hemoglobinuria and other clinical signs were often followed by abortion during convalescence.

Fetal material was obtained after two abortions and leptospiras were demonstrated in silver-impregnated sections of the fetal liver and kidney in both cases.

This is interpreted as indicating a penetration of the placental barrier by leptospiras during maternal leptospiremia, followed by a fatal leptospirosis in the fetus, and abortion.—*K. L. Fennestad and C. Borg-Petersen in Nord. Vet.-med. (May, 1958): 302.*

Tranquilizing Drugs in Human and Veterinary Medicine

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THE ARTIFICIAL and experimental induction of neuroses and even psychoses in animals has been amply demonstrated.[2] Cats and monkeys were severely frustrated by withholding food and by creating fear and panic in these animals with the use of grille shock and the sudden appearance of toy rubber snakes during food intake. Following this, they became withdrawn, showing behavior similar to a psychotic human being. It was demonstrated in one monkey that during a psychotic episode a banana would pass the entire gastrointestinal tract undigested.

It is obvious that some forms of unruliness, gastrointestinal disturbance, and other behavior deviations in animals are based on an emotional imbalance, just as they are in human beings. While the definite site of the seat of emotions in the brain remains subject to speculation, certain guides have been established in this direction.

With the advent of the tranquilizing drugs in human psychiatry, especially the phenothiazine compounds, research on the physiology of emotions in human beings, as well as in animals, has enjoyed a new upward trend.

ADVANTAGES OF TRANQUILIZING DRUGS

Before the development of these drugs, the chief chemical restraints available for animals were barbiturates, bromides, chloral hydrate, and paraldehyde. These drugs produced a state of deep sedation or sleep in which the animal was rendered helpless, often creating new nursing problems. If consciousness was desired, mechanical restraint was employed in both man and other animals. Since tranquilizing drugs have been used, mechanical restraints have been almost abandoned.

The mode and site of action of these drugs is believed to be in subcortical levels, such as the thalamus, hypothalamus, mesencephalon, and reticular substance. Thus, it is believed that the cerebral cortex is not affected by tranquilizing drugs —the animal is not stupefied by reducing cerebral oxygen consumption; neither does the human being fall asleep if proper dosages are applied. A general quiescence prevails from which both animals and man can be easily aroused.

It was this latter observation made on guinea pigs[3] which suggested that such a state of quiesence without sleep would be desirable in mentally ill persons. These investigators were working with phenothiazine compounds, trying to find a new antihistaminic drug. After their use in human psychiatry, the phenothiazine compounds were used in veterinary medicine.

Phenothiazine compounds have the ability to produce, in addition to general tranquility, a greatly reduced response to disturbing stimuli. They also cause a rise in the pain threshold, which makes these compounds feasible as adjuncts to anesthetics. They have been used in the relief of pain in cancer, but their usefulness in human psychiatry is partially ascribed to the fact that the patient, possibly due to his raised pain threshold, is less annoyed by disturbing ideas of his own and irritating conditions of his environment, whether the latter be true or imaginary.

The effect of phenothiazine compounds on emotionally disturbed persons is encouraging. Mental illness causes regression, a return to habits of early childhood, and older psychiatric textbooks compared regressed human behavior with that of an animal, at times even describing a patient as behaving and acting "below animal level."

At the insidious beginning of a malignant mental illness, one observes withdrawal from other human beings. This, in analogy to the animal kingdom, is still called the loss of the herd instinct. Such behavior is frequently observed in mental hospitals, where long rows of silent patients are seen.

Lack of control of toilet habits is another sign of regression. Violence, such as breaking furniture or injuring others or themselves, may be the ultimate expression of a panic, possibly caused by dis-

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turbing ideations originating within the patient. Denudativeness, or unwillingness to keep dressed, is another early childhood habit to which regressed mental patients frequently return.

A three-year study at the Elgin State Hospital[4-6] revealed that of 736 female patients treated, all showing incontinence, combativeness, and denudativeness, 70 per cent had responded to treatment and 220 had been discharged from the institution. Of these, 48 were gainfully employed, only eight were idle at home, and 45 had been returned. The average stay of these patients in the institution had been eight years, and most of them had been given up as "chronically and hopelessly insane." Treatment with phenothiazine compounds continues after the patients leave.

This survey, presently in its fourth year, is being continued. We have evidence that 50 per cent of those patients had relapses at home after we had replaced the active compound with an inactive placebo with an identical appearance. Some patients may have to take these drugs for years. Dosages constantly have to be adjusted and readjusted while patients are in the hospital and after they leave.

Side effects experienced with these drugs are so few and mild that the drugs are well worth the risk they involve.

APPLICATION IN VETERINARY MEDICINE

If the term "interpersonal relationship" regarding human beings is applied to the herd instinct in animals, and if "management of human patients" is applied to taming and training animals, one can readily see the correlation regarding human and animal behavior. It was for this reason that tranquilizing drugs so easily found entrance into veterinary medicine.

Small animals are reported to be much more docile when given tranquilizing drugs, especially phenothiazine derivatives.[1] In dangerous dogs, the agents, given intramuscularly or intravenously, produced results within 15 to five minutes, respectively. The drugs are of great value in x-ray therapy, when animals are expected to lie quietly. Inasmuch as the pain threshold is raised by phenothiazine compounds, they are useful in anesthetic procedures, reducing the amount of the anesthetic agent by about 50 per cent. Numerous other uses of tranquilizing drugs in veterinary practice have been reported and need not be repeated here.[1-6]

CONCLUSION

As a whole, great progress has been made with the introduction of tranquilizing drugs in human and veterinarian medicine. In human medicine, it is the relative who benefits simultaneously with the improvement of the mental patient while, in veterinary medicine, it is the owner who benefits with the improvement of his animal.

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Confusion in Use of Tranquilizers.—The place for tranquilizers in treating the mentally ill is not clear. The phenothiazines and Rauwolfia drugs are called "tranquilizers" but so are the meprobamates (Miltown, Equanil) which are more like sedatives. The former are effective in the control of excitement in psychotic patients but in some cases they aggravate the anxiety.—*Sci. News Letter (May 31, 1958): 347.*

The Resistance of Coccidioides.—The soil fungus which causes coccidioidomycosis or valley fever will live throughout the hottest dry months in isolated small pockets 6 to 8 inches in the earth but will be destroyed near the surface. Some unknown factor seems to favor the growth of this fungus in certain habitats.—*Sci. News Letter (June 7, 1958): 361.*

Surgery and Obstetrics
and Problems of Breeding

Fracture Repairs with the Jonas Splint – Five-Year Report on All Published Cases

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FIVE YEARS have elapsed since the Jonas self-retaining medullary extension splint was first introduced.[1] This is a follow-up report on all of the 14 cases (table 1) which we have described in seven reports.[1-7]

The splint has been revised several times but, from the first, it has been made of austenitic stainless steel, including the spring, to eliminate the possibility of electrolytic reaction. The splints used in cases 1 and 2 had a tube or sleeve with a thin wall, the spring within the tube was loose, and the length of the projection of the pin could not be perfectly controlled.

The tubes used in cases 3 to 7 had a stronger wall and had been crimped at one end to control the length of the portion of the pin which was projected out of the sleeve. The splints used in cases 1 to 7 were made of annealed stainless steel of soft temper, but the tubes used in cases 8 to 14 were made of hard tempered austenitic stainless steel, with the wall considerably strengthened and closed at one end with a cap.

The spring is no longer loose. It is attached to the cap at one end and to the pin at the other end. This is done to control the over-all length of the splint and the force with which the pin is projected from the sleeve into the opposing fragment.

All parts are interlocked into one unit by compression—not by welding, which would introduce extraneous material that might induce electrolytic reaction.

CASE REPORTS

Case 1.[1]—A Thomas splint had been applied to a transverse fracture of a femur in a cat, 12 days before the radiograph (fig. 1) was taken. After open reduction and insertion of the splint on Dec. 20, 1952, the patient was discharged in 11 days, walking with almost no limp.

A radiograph taken eight months later (fig. 2) showed that the tube had broken at the junction with the pin. Apparently the tube, made of thin metal, could not withstand the stress from unlimited exercise during the period of osteogenesis. These factors may also account for the excessive callus formation.

The cat lived for three years and at no time did it show lameness or bad aftereffects.

Case 2.[1,2]—To reduce a fracture of a tibia of a 2-year-old Fox Terrier, the tube of the splint was inserted into the distal fragment and the pin was projected into the proximal fragment. Radiographs taken six and 12 months later showed a slight bowing of the bone and splint, but in the next two years the dog showed no sign of lameness or discomfort.

Case 3.[2]—A compound fracture of the radius and ulna in an 8-month-old Collie bitch (fig. 3) was repaired April 15, 1953, by inserting the second model of the splint into the radius; the ulna was only approximated. In radiographs taken over a period of four years, the callus formation could be seen in 31 days and was nearly completed in three months. The callus was denser in the radius than in the unsplinted ulna, and there was no fusion between these bones.

Four years later (fig. 4), the position of the splint was unchanged. At no time has the dog suffered from lameness or discomfort.

Case 4.[3]—A compound, spiral fracture of the distal end of the tibia and fibula in an 11-year-old Spitz (fig. 5) was reduced Aug. 4, 1953. A normal callus was present 74 days later and in six months bone repair was completed, with a dense homogeneous permanent callus.[3] Four years later, when the dog was 15 years old, a radiograph (fig. 6) showed no change. The dog showed no special discomfort from the pinned leg.

Case 5.[2]—A 5-month-old pup suffered a midshaft fracture of the right femur (fig. 7). A radiograph taken 138 days after the

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The author thanks Prof. Charles O. Bechtol, head, Department of Orthopedic Surgery, Yale University Medical School, New Haven, Conn., for the tests he made, and Dr. Robert M. Lowman, director, Department of Radiology, Grace New Haven Community Hospital, New Haven, Conn., for reviewing some of the cases radiologically.

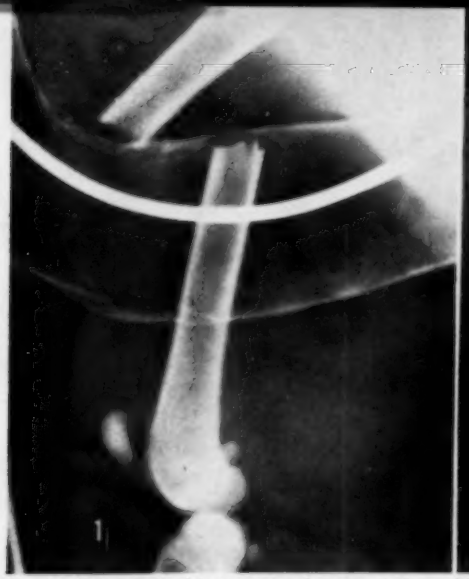

Fig. 1—Radiograph of a transverse fracture at the midshaft of the femur of a cat (case 1). Note ring of Thomas splint and 1-inch separation of fragments.

Fig. 2—Eight months after the reduction of the fracture shown in figure 1; an extra large, but healthy callus had formed. Note broken tube in this experimental splint made of soft metal, which did not cause pathological changes.

operation showed that the position of the splint was unchanged in relation to the fracture line, but the distance between the splint and epiphysis had greatly increased, indicating that the splint did not interfere with the normal growth of the bone. The ossification was completed with a solid, dense callus and the fracture line was not visible. The bones grew to their full length following internal fixation, and careful measurements showed that there was only 1/16 inch difference in length of the femurs. The last radiograph, taken 2½ years later (fig. 8), showed no bone changes and the splint had not shifted its position. Four years have elapsed since the operation and this dog is being used as a watchdog and is apparently in perfect condition.

Case 6.[3]—An "explosion" fracture of the left tibia and fibula at the epiphyseal line, caused by a gunshot injury, in a 2-year-old cat (fig. 9) was infected and suppurating where the distal part of the tibia was shattered into numerous fragments. The remaining bone and surrounding muscles were devitalized by the infection and the many lead particles imbedded in them.[3]

The splint was inserted into the tibia eight days after the injury. The versatility of the splint was demonstrated in this case where it was anchored at both ends in solid bone, with a section of exposed metal bridging the span of missing bone. This

Fig. 3—This radiograph shows a jagged, transverse, compound fracture of the radius and ulna close to the epiphysis, with displacement and over-riding (Collie bitch, case 3).

Fig. 4—This radiograph (anteroposterior and lateral views) was taken almost four and one half years after reduction of the fracture shown in figure 3. The lateral view was necessary to measure lumen of medullary canal for selection of splint. Note curvature and narrow lumen and lack of fusion between ulna and radius.

Table 1—Up-to-Date Report on All Our Published Cases of Fractures Repaired with the Jonas Splint Over a Five-Year Period

Case and references	Progress of bone repair	Last report
Case 1[1]—Fractured femur of cat (fig. 1), reduced 12/20/52; date of last published radiograph, 12/10/52 (fig. 1), of last radiograph, 8/25/53 (fig. 2).	This splint made of soft metal with thin wall; extra large but healthy ossified callus in spite of broken tube.	Active and healthy until struck by car 3 years later.
Case 2[1,2]—Fractured tibia of 2-yr.-old Fox Terrier, reduced 12/27/52; date of last published radiograph, 12/17/53.	First intention healing; homogeneous callus; fr. line not visible six mo. after reduction; slight curvature of tibia and splint.	Was in perfect condition until late 1955; owner moved away and lost contact.
Case 3[2]—Fractured radius and ulna of 8-mo.-old Collie (fig. 3), reduced 4/15/53; date of last published radiograph 10/14/53; of last radiograph, 8/26/57 (fig. 4).	First intention healing; good callus 31 days; repair almost completed at 81 days; callus in radius denser than in unsplinted ulna; no fusion between these bones.	2/15/58 Collie in perfect condition with no trace of lameness.
Case 4[2]—Spiral fracture of the tibia and fibula of an 11-yr.-old Spitz dog (fig. 5), reduced 8/4/53; date of last published radiograph 2/6/54; of last radiograph 8/27/57 (fig. 6).	First intention healing; callus visible when radiographed on 74th day; radiograph at 6 months shows healthy bone formation; subsequent radiographs over 4 yr. show no change.	2/21/58 Dog 15½ yr. old; suffering from old age but no lameness or discomfort from fractured leg; this bone will later be available for study.
Case 5[2]—Fractured femur of a 5-mo.-old Terrier pup (fig. 7), reduced 9/17/53; date of last published radiograph 2/2/54; of last radiograph 4/10/56 (fig. 8).	First intention healing; repair completed in 138 days; callus homogeneous; both epiphyseal ends grew away from splint; growth of bone can be measured by using splint as marker.	2/28/56 4 yr. 3 mo. after reduction, dog was used as watchdog; in perfect condition; no lameness or discomfort.
Case 6[2]—Epiphyseal fracture of tibia of 2-yr.-old cat as result of gunshot injury (fig. 9), reduced 8/2/53; date of last published radiograph 4/24/54; of last radiograph 5/26/56 (fig. 10).	First intention healing; all loose bone fragments placed against exposed metal of splint were gradually absorbed and incorporated into a healthy callus; no incompatibility between bone, splint, and lead particles.	Report from Dr. Benjamin Sann on 2/15/58; cat running freely and climbing trees; no lameness or discomfort.
Case 7[3]—Fractured humerus of 7-mo.-old Shepherd dog (fig. 11), reduced 3/24/54; date of last published radiograph 11/15/54; of last radiograph (postmortem) 5/25/56 (fig. 12).	First intention healing; normal bone repair with solid ossification; no change in position of splint or condition of bone since repair was completed; no lameness.	5/25/56 Euthanized; radiographs show strong and healthy bone repair; splint in long axis of humerus with nose of pin in medial condyle; no corrosion in retrieved splint.
Case 8[4]—Fractured femur of 5-mo.-old mixed Cocker pup (fig. 13), reduced 4/11/55; date of last published radiograph 4/11/55 (fig. 14).	Most perfect alignment with new splint; healing by first intention; pup was walking well and standing on hindlegs 7 days after operation when discharged.	5/15/55 Radiograph showed healthy callus with good union; dog running freely with no trace of lameness; disappeared from home 3 months later.
Case 9[5]—Malaligned humerus of 5½-mo.-old Collie bitch (fig. 15), reduced 11/26/55; date of last published radiograph 4/7/56; of last radiograph 2/8/58 (fig. 16).	Fracture reduced 17 days after injury; first intention healing with good bone repair; all loose fragments absorbed into solid homogeneous callus.	2/12/58 Dr. Charles P. Hines sent in radiograph showing no change in perfectly healed fracture; no lameness or discomfort.
Case 10[6]—Epiphyseal fracture of femur of 4-mo.-old Terrier pup (fig. 17), reduced 5/21/55; date of last published radiograph 11/27/56 (fig. 18).	First intention healing in spite of additional fracture in pelvic girdle; automatic extension of splint within growing bone; both femurs equal length.	2/20/58 Examined at owner's home; dog in excellent condition; no lameness or discomfort; used as watchdog.
Case 11[6]—Epiphyseal fracture of femur of 3-mo.-old Collie pup, reduced 6/9/56; date of last published radiograph 8/4/56; of last radiograph 9/30/56.	First intention healing with normal solid callus; splint extended itself automatically corresponding to the growth of the bone; both femurs identical in length.	9/30/56 Last radiograph; full compatibility between splint and growing bone; killed 10/5/56.
Case 12[7]—Comminuted fracture of humerus of 2-yr.-old Collie dog (fig. 19), reduced 12/28/55; date of last published radiograph 11/5/56; of last radiograph 2/22/58 (fig. 20).	First intention healing; radiographs taken in successive stages of bone repair show gradual absorption of all loose fragments and formation of healthy ossified callus.	2/22/58 Dog in perfect condition; no lameness or discomfort; full use of humeroradial articulation; nose of pin in longer lateral condyle.
Case 13[8]—Experiment by Prof. Chas. O. Bechtol; tibia and fibula of a 7-mo.-old mixed Collie dog fractured and repaired with Jonas splint to test its corrosion-resistance and compatibility between splint and bone 12/14/55; experiment completed 2/29/56.	First intention healing of incision; 2-cm. section removed from tibia to prolong process of bone repair and induce friction between component parts of splint, and between splint and bone; also test for pressure necrosis each end of bone.	2/29/56 Dog euthanatized; recovered bone showed perfectly normal osteogenesis; no corrosion in metal; no pressure necrosis in bone; full compatibility between splint and bone. Healthy callus bridged both fragments.
Case 14[4]—Dual fracture of radius and ulna of a 1½-yr.-old Setter dog, reduced 10/7/53; date of last radiograph 7/12/55; radius and ulna of both legs presented to Prof. Chas. O. Bechtol for comparative study.	First intention healing; normal osteogenesis; radiographed over period of 1½ yr. to show stages of bone repair.	7/12/55 Fractured radius 1/16 inch shorter than opposite radius; perfect bone repair; fr. bone 25% stronger than unfractured radius; no corrosion in metal; full compatibility between splint and bone.

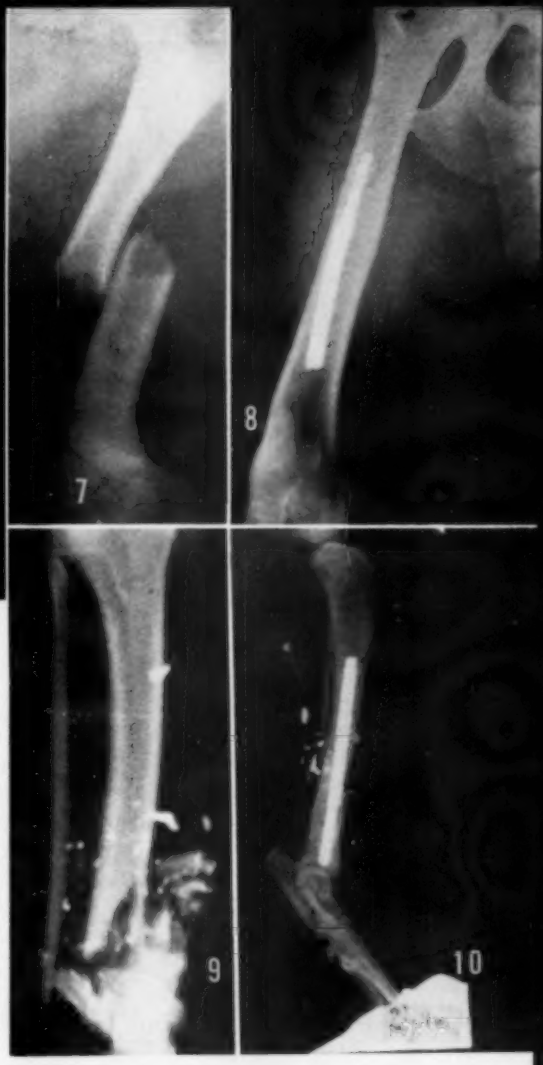

Fig. 5—Spiral compound fracture at the distal end of the tibia and fibula of a dog, with displacement and about 1½ inches over-riding (case 4). Note two longitudinal fractures of distal fragment of tibia extending to epiphysis.

Fig. 6—This radiograph shows perfect bone repair after four years (case 4); there is no change from last published radiograph.

Fig. 7—Transverse midshaft fracture of right femur with over-riding in a 5-month-old pup (case 5).

Fig. 8—Radiograph taken 2½ years after reduction (case 5); fracture line is not visible; both epiphyseal ends grew away from splint. Growth of bone can be measured by comparing this radiograph with one taken the day of reduction, using splint as marker.

Fig. 9—Explosion fracture of the left tibia and fibula at the epiphyseal line, caused by gunshot injury in a 2-year-old cat (case 6); section of tibia at distal end destroyed and shattered.

Fig. 10—Radiograph, taken two years, nine months after reduction (case 6), shows healthy bone identical to last published, taken nine months after reduction. No electrolytic reaction between splint, bone, and lead particles.

enabled us to place many loose particles of bone around the metal and against the tibia to serve as a graft and matrix for new bone formation.

A radiograph taken 76 days after the operation showed that the splint was still in place, surrounded by many islands of ossification which were integrating into good callus. The last published picture, taken nine months after reduction, showed a healthy callus formation and a good bone repair in spite of the many lead particles which were not removed. A radiograph* (fig. 10), taken May 10, 1956, two years and nine months later, is identical with the last published picture. On Feb. 15, 1958, the cat was still running freely and climbing trees without any signs of lameness or discomfort.

Case 7.[4]—A comminuted fracture, in a 7-month-old German Shepherd (fig. 11), involved the distal quarter of the left humerus, extending almost to the epiphyseal line, with about ¾ inch over-riding, and with a large bone fragment about ¾ inch long completely detached from the bone.

The splint was inserted into the humerus and additional support for immobilizing the fracture was provided with a plaster of paris cast, beginning below the humeroradial articulation and extending over the fractured humerus and scapula. The cast was removed on the eighteenth day and a radiograph showed that the loose bone

*Taken by Dr. Benjamin Sann, Sommers, N.Y.

fragment was becoming incorporated into the newly forming osteogenic tissue.

A radiograph taken 65 days after reduction showed a large but normal callus formation, and the last published radiograph, taken seven months and 16 days after the operation, revealed a completely repaired bone. This dog suffered no lameness or discomfort after healing. When the owner brought the dog to us for euthanasia two years and two months later, we recovered the repaired humerus for study. Two views of the bone (fig. 12) show good solid ossification.

A sagittal section of the bone revealed a healthy, solid ossification, and the retrieved splint did not show any trace of corrosion.

Case 8.[4]—The latest improved model splint (M-1) was used to reduce a comminuted oblique fracture of the left femur in a 5-month-old female pup (fig. 13). The sleeve was inserted into the reamed-out canal of the distal fragment and the pin projected into the proximal fragment (fig. 14). No additional means of immobilization was used, and the dog was able to stand on its hindlegs and walk well when discharged nine days later. Three months after reduction, the owner informed us that the dog had disappeared a week previously, but had been in perfect condition up to that time.

Case 9.[5]—A 5½-month-old Collie bitch was struck by a car on Nov. 9, 1955, and suffered a fracture of the left humerus and lacerations. There was also a slight paresis of the hindquarters. It was impossible to bring the fragments of the humerus into apposition with traction or a Thomas splint and, as a result, poor alignment of the humerus developed.

Fig. 11—Comminuted fracture of left humerus in a 7-month-old German Shepherd dog (case 7).

Fig. 12—Radiograph taken two years, two months after reduction (anter-posterior and lateral views postmortem). Splint in long axis of humerus with nose of pin in longer medial condyle (case 7).

Fig. 13—Comminuted oblique fracture of the left femur, extending from the proximal to the distal third, in a 5-month-old female pup (case 8).

Fig. 14—Radiograph showing perfect reduction of femur with latest model splint (case 8); fracture lines are barely visible.

Fig. 15—Malaligned canine humerus, 17 days after fracture, with large callus (case 9).

Fig. 16—Radiograph taken two years, three months after reduction (case 9); bone has retained its healthy condition—there is no change in position of splint.

Fig. 17—Ventrodorsal radiograph of a 4-month-old pup showing a distal epiphyseal oblique fracture of the femur (a), fracture of the pubis (b), ischium (c), and the epiphyseal separation of the articular cartilage of the femoral head (d) (case 10.)

Fig. 18—Radiograph taken one year, six months after reduction (case 10); fractured right femur grew to same length as the opposite left femur; bone in healthy condition.

We saw this dog for the first time on Nov. 26, 1955, 17 days after the injury. Our radiograph, taken the same day (fig. 15), shows the poor alignment with more than an inch of over-riding and separation between the fragments. Osteogenic tissue had formed a callus about 9 cm. in diameter in a futile attempt to fill in the gap.

Reduction of the fracture, using a medial approach, was accomplished two days later using an M-2 splint. There was extensive soft tissue trauma during the prolonged surgical procedure, and a Thomas splint was therefore applied for additional immobilization. It was removed after seven days.

The dog began to put weight on the fractured leg the day the Thomas splint was removed. The last published radiograph, taken four months and ten days after the operation, showed a solid homogeneous integration of all fragments into healthy ossified bone. A radiograph (fig. 16**), taken two years and three months after the operation, showed that the splint had not shifted its position within the completely healed bone, and the humerus had retained its healthy condition.

Case 10.[6]—A 4-month-old male Terrier pup was hit by a car on May 21, 1955, and sustained a fracture of the right pubis and ischium, two fractures of the right femur, an oblique fracture just proximal to the distal epiphysis, and epiphyseal separation of the articular cartilage of the femural head (fig. 17).

The fractured femur was repaired with an M-2 splint and a Thomas splint was applied for four days. Radiographs taken 24 days later showed a normal proliferation of osteogenic tissue with a healthy callus, and the dog was observed walking and jumping, with no trace of lameness. A later radiograph, taken 55 days after reduction, showed that the bone repair was nearly completed. The splint remained anchored at both ends as when first inserted, but kept extending itself automatically, corresponding to the additional growth of the femur.

The last published radiograph was taken on Nov. 9, 1956, 18 months after reduction, and showed that the right fractured femur grew to the same length as the opposite left femur, and that the extension splint did not interfere with the normal growth of the bone in this young dog, while it gave full support and immobilization during the process of osteogenesis.

This dog was examined on Feb. 20, 1958; it showed no trace of lameness or discomfort.

Case 11.[6]—The repair and results of an oblique fracture of the right femur near the distal epiphysis, in a 3-month-old male Collie pup (May 14, 1956), were similar to those in case 10, and the radiograph taken 82 days after reduction showed even more clearly the gradual automatic extension of the splint within the bone. The bones were

**Sent in by Dr. Charles P. Hines.

fused solidly, no fracture lines could be detected, and the femur has grown to the same length as that in the opposite leg.

The splint had been inserted under about ¾ inch pressure (¾ inch longer than the sum total of the medullary canal of both fragments) to insure anchorage into the distal epiphyseal fragment and to allow for the gradual extension and over-extension of the splint within the growing bone.

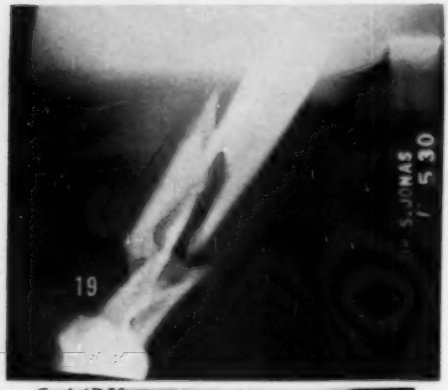

Fig. 19—Comminuted fracture of the humerus of a Collie bitch (case 12); note jagged points and large fragment detached from the bone.

Fig. 20—Lateral radiograph taken two years, two months after reduction (case 12); position of the splint is unchanged in long axis of healed humerus. Nose of pin in longer medial condyle which is superimposed by the olecranon fossa and shorter lateral condyle. No interference with articulation.

Radiographs taken during the period of bone repair showed that both ends of the splint remained firmly anchored in the same position as when first inserted and, as the bone extended itself through additional growth, the tension on the spring was gradually reduced and the splint automatically elongated itself corresponding to the growth of the bone, thus giving prolonged support and immobilization during the period of osteogenesis.

Although the dog was doing well, it was later euthanatized.

Case 12.[7]—On Dec. 28, 1955, a Collie bitch, 2½ years old, sustained a comminuted fracture of the humerus extending from the midshaft to the far distal end of the bone (fig. 19). The proximal fragment had a long, sharp, jagged point, and a fragment about 2 inches long at the distal end detached from the humerus.

A radiograph taken 4½ months after reduction demonstrated that all fragments had become absorbed and incorporated into the callus which had become homogeneous and ossified. The last published radiograph, taken ten months after reduction, showed that the position of the splint within the humerus had remained unchanged, and there was complete compatibility between the splint and bone.

The last radiograph (fig. 20) was taken on Feb. 22, 1958, two years and two months after the operation. The dog is without the slightest trace of lameness or discomfort.

Case 13.[4]—An experimental fracture of the tibia and fibula of a 7-month-old mixed Collie was made Dec. 14, 1955,† to determine whether corrosive changes would develop in the metal of the splint during a bone repair, or in a delayed union, causing a pathological condition, and whether pressure necrosis would develop at each end of the bone when a splint was inserted under tension.

The medial aspect of the tibia was exposed and a 2-cm. section of bone was removed. A Jonas splint, about ¾ inch longer than the total length of the medullary canal of the remaining fragments, was inserted to keep the bones apart and to delay union. No additional immobilization was used. The open space between the two fragments of bone allowed a sliding movement of the pin within the longitudinal axis of

†By Prof. Charles O. Bechtol, with the author assisting.

the tube whenever the dog put weight on the leg, and an interaction between bone and splint during the period of bone repair.

The dog was euthanatized on Feb. 29, 1956, 77 days after the operation, to recover the tibia and splint for examination. The bone showed normal osteogenesis and, when sectioned, did not reveal any sign of pressure necrosis or any other pathological changes. Healthy callus bridged both fragments. No trace of corrosion could be found in the splint.

Case 14.[4]—A dual fracture of radius and ulna in a 1½-year-old Setter was reduced on Oct. 7, 1953, and the dog recovered, without any signs of lameness or discomfort. Radiographic records were made of this dog for 1½ years before it was killed by a car.

An examination revealed that the fractured left radius was less than 1/16 inch shorter than the corresponding right radius. The fractured bone showed no pathological changes and it was stronger than the uninjured right radius in that it withstood approximately 25 per cent more pressure before breaking. No trace of corrosion could be detected in the retrieved splint, and there was no evidence of any incompatibility between the splint and osteogenesis.

SUMMARY

This paper gives a report of 14 cases of fractures of long bones repaired with the Jonas splint, described in various veterinary publications over the past five years. The splint demonstrated its versatility not only in simple, but also difficult comminuted fractures. It was used successfully both in mature and growing animals. Growth of the bone could be studied in a transverse fracture of the femur in a 5-month-old pup,[3] by using the splint as a marker, where both epiphyseal ends were growing away from the splint which remained in the same position relative to the fracture line.

In epiphyseal fractures of 2 pups,[6] 4 and 3 months old, respectively, where both ends of the splint were anchored firmly, the growth of the bone could be studied radiographically by the automatic elongation of the splint which, because of its spring mechanism, increased its length corresponding to the additional growth of the bone, while providing continuous support during the process of osteogenesis.

There was no gravitation of the splint in any case, as it never shifted its position once inserted in the bone.

There were no electrolytic reactions or pathological changes in any of the animals, and all fractured bones grew to normal length. Healing, in every instance, was by first intention.

No corrosion[4] could be detected in the retrieved splints, and there was full compatibility between the splint and bone during the years in which the patients were under observation.

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[7]Jonas, Salo, and Jonas, Albert: Repair of a Comminuted Fracture of the Humerus with the Jonas Splint. North Am. Vet., *38*, (Sept., 1957): 277-279, 284.

Estrus in Cows During Pregnancy

Records in a large dairy herd showed that 18 per cent of 1,905 cows showed heat during pregnancy. Insemination of such cows by the intrauterine method usually resulted in abortion.

If pregnancy is suspected, inseminators should spray the semen over the cervical os. This will do no harm and, in case the cow is not pregnant, will often result in pregnancy.—*Hoard's Dairyman (June 25, 1958): 663.*

Contamination of Incisions with Cancer Cells.—In operations for cancer of various abdominal organs, implantation was found to account for nearly half the recurrences of cancer at the suture line. In 120 operations, malignant cells were detected in wound washings from 26 per cent.—*Brit. Med. J. (April 19, 1958): 940.*

Clinical Data

Use of a New Adrenocortical Steroid (Ultracortenol) in Bovine Ketosis

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THE VALUE of adrenocortical steroids, principally cortisone, hydrocortisone, prednisone, and prednisolone, is now well established[3,5,7,11] in the treatment of bovine ketosis. From the clinician's standpoint, the usefulness of these steroids would be materially enhanced by the prolongation of their glucocorticoid activity following single injections.

Recently, as the result of an intensive search for longer acting steroids, an ester of prednisolone, the most active glucocorticoid in common veterinary use, was synthesized. This ester, prednisolone trimethylacetate, has been shown to exert longer therapeutic effects following a single injection than the other cortisone derivatives because the rate of absorption is slower and because its rate of degradation in the liver, as well as in the peripheral tissues, is slow.[8] The chemical formulas of prednisolone free alcohol and prednisolone trimethylacetate (Ultracortenol*) are shown (fig. 1).

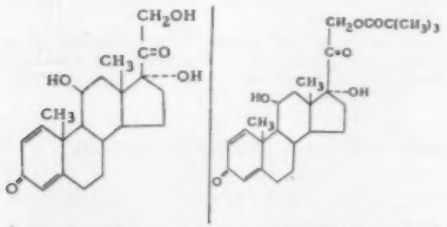

Fig. 1—The chemical formulas of prednisolone (left) and prednisolone trimethylacetate (right).

USE IN LABORATORY ANIMALS[2]

Liver Glycogen Effects.—A reliable test for the "carbohydrate" activity of adrenocortical steroids is to measure the level of liver glycogen in the fasted adrenalectomized rat.[6] Single injections of 50 μg. of steroid were given to fasted rats and the animals were killed for determination of liver glycogen six hours later. At that time, the liver glycogen values of prednisolone-treated animals were eight times those of controls, whereas those receiving prednisolone trimethylacetate had liver glycogen values 25 times those of the controls.

Effect on Survival of Adrenalectomized Rats.—A single dose of 5 mg. of prednisolone free alcohol administered intramuscularly to immature adrenalectomized rats at the time of adrenalectomy extended their survival time from five days in untreated animals to nine days in the treated group. Prednisolone trimethylacetate in the same dose resulted in a survival period of 17 days.

This test indicated not only a greater duration of activity but also a greater total effectiveness of a given amount of the ester.

Effect on Growth Rate.—Since the glucocorticoids in general inhibit the growth rate of young animals, this activity can be used to measure the effectiveness and duration of action of single doses. A single injection of prednisolone free alcohol inhibited body growth for about four days; a similar injection of prednisolone trimethylacetate inhibited growth for at least ten days.

Thymic Atrophy.—The glucocorticoids cause atrophy of the thymus in young animals. This was one of the early tests found reliable to compare relative activities of various steroids.[9] A single injection of prednisolone free alcohol had a maximal thymolytic effect at four days, with recovery occurring in about two weeks; a similar injection of the ester maintained an atrophic state in the thymus for over 21 days.

Anti-Inflammatory Activity.—The granuloma test, which measures the degree of inhibition of the mesenchymal reaction to the subcutaneous implantation of a foreign body, allows a quantitative evaluation of the local or systemic inhibition of inflammatory reactions as well as its duration.

Dr. Vigue is associate in research, Nasson College, Springvale, Maine.

These studies were supported in part by grants to the Biochemistry Department, Nasson College, from the Research Department of Ciba Pharmaceutical Products, Inc., Summit, N.J.

*Supplied through the courtesy of Dr. George B. Belloff, Ciba Pharmaceutical Products, Inc., Summit, N.J.

In one experiment, cortisone was arbitrarily given a coefficient of activity of 1 when employed locally. Prednisone, when used in the identical manner, was found to possess only a quarter to a third of the activity of cortisone; prednisolone free alcohol was about as active as cortisone; hydrocortisone was one and a half to two times as active; 9*alpha*-fluorohydrocortisone two to three times as active; and prednisolone trimethylacetate 15 to 20 times as active as cortisone.

In view of the high activity of this new prednisolone ester, an evaluation of its usefulness in the treatment of bovine ketosis appeared justifiable.

MATERIALS AND METHODS

A total of 43 dairy cows was selected from herds close to the college laboratory and allotted to three groups.

Group 1 consisted of 9 normal cows, each of which was given 50 to 500 mg. of prednisolone trimethylacetate as a single injection, to determine clinical effects as well as biochemical effects.

Group 2 consisted of 19 cows with clinical ketosis, each treated with 50 to 500 mg. of prednisolone trimethylacetate in a single dose, to determine the therapeutic value of the steroid when employed as the sole therapy.

Group 3 consisted of 15 cows with clinical ketosis, each given 50 to 200 mg. of prednisolone trimethylacetate simultaneously with conventional glucotherapy, to determine if combined steroid-carbohydrate therapy would allow use of a smaller quantity of the glucocorticoid to reverse the ketosis syndrome.

The prednisolone trimethylacetate was administered intramuscularly in a concentration of 10 mg. per cubic centimeter in a sterile aqueous suspension. Blood chemical determinations were the same as previously reported.[9]

RESULTS AND DISCUSSION

Group 1.—The most noticeable clinical effect of the steroid in the 9 normal cows, 5 of which were dry and the other 4 near the end of lactation, was a marked increase in appetite developing within 24 hours following injection of 100 mg., or more, of prednisolone trimethylacetate. Milk production decreased 10 to 20 per cent in all 4 lactating cows. Doses of 400 mg., or more, were occasionally followed by sweating.

Six of the 9 cows defecated and urinated more frequently and their feces were somewhat softened for ten to 48 hours. This has also been observed following administration of large doses of the other commonly used glucocorticoids.[1]

In normal cows, hyperglycemia developed within 12 hours following administration of 100 mg., or more, of prednisolone trimethylacetate and lasted for 12 to 48 hours, depending on the quantity injected (chart 2). This indicated a relatively rapid and sustained hyperglycemic effect. The increase in blood sugar of normal cows was not as rapid as with either prednisone or prednisolone free alcohol when employed in the same amount, but the duration of the hyperglycemia was more than doubled.[12]

Group 2.—Generally, ketotic cows treated with a single injection of 50 to 500 mg. of the steroid as the only therapy responded favorably, with the exception of those given only 50 mg. The optimal dosage in this small group was found to be 100 to 200 mg.; an occasional animal may require larger amounts.

In those cows responding satisfactorily, clinical improvement was apparent within 12 to 24 hours. Appetite was restored and

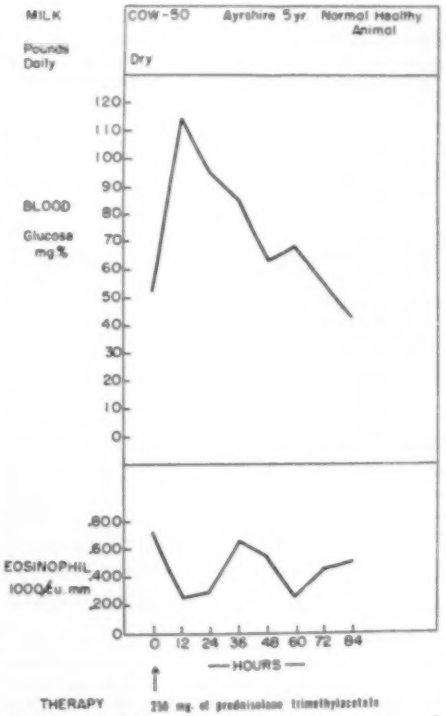

Chart 1—This shows the effect of 250 mg. of prednisolone trimethylacetate on a normal cow. Hyperglycemia developed within 12 hours and persisted for 48 hours.

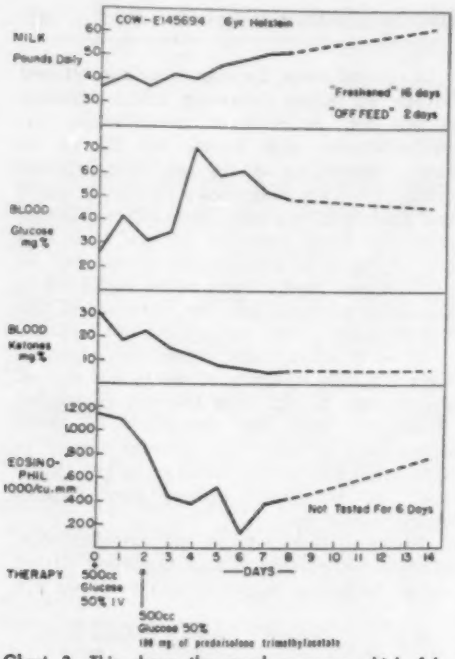

Chart 2—This shows the good response which followed treatment of a ketotic cow with 200 mg. of prednisolone trimethylacetate as the sole therapy.

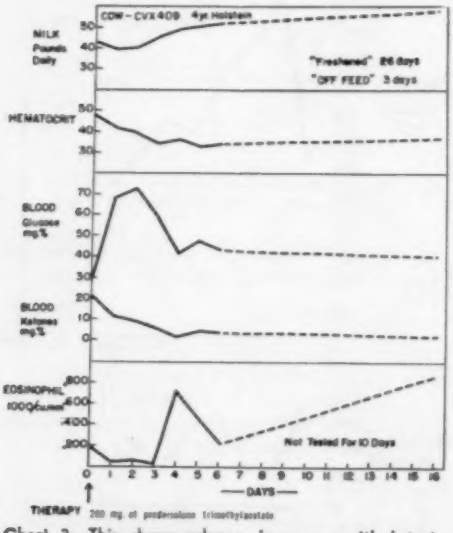

Chart 3—This shows relapse, in a cow with ketosis, after conventional glucotherapy, with recovery following re-treatment with a combination of glucose and 100 mg. of prednisolone trimethylacetate.

maintained, signs of depression disappeared, and the odor of acetone on the breath and in the milk was hardly noticeable after 48 to 96 hours. Milk secretion was usually depressed for no longer than 48 hours.

Biochemical studies indicated a good degree of hyperglycemia within 12 hours after treatment. The increase in blood sugar persisted for 24 to 72 hours, depending on the dose of the steroid given. Ketonemia returned to normal within 24 to 96 hours in those cows responding to therapy.

Because of the prolonged duration of hyperglycemia, it is our opinion that prednisolone trimethylacetate comes the closest of all available glucocorticoids to being the ideal "depot" steroid for use in the treatment of hypoglycemia associated with bovine ketosis. Hematocrit determinations also revealed prompt rehydration (chart 3).

Group 3.—It has been observed[4] that simultaneous administration of carbohydrate decreases the catabolic effect of glucocorticoids; therefore, an attempt was made to ascertain if the assistive use of glucotherapy would make possible the use of smaller amounts of prednisolone trimethylacetate to effectively reverse the ketosis.

A total of 15 ketotic cows, 5 of which had responded only temporarily to carbohydrate therapy, were given 50 to 200 mg. of steroid in conjunction with glucose or glucose-fructose. When employed simultaneously with carbohydrate, the optimal dose could be reduced to 50 to 100 mg.

It is our opinion that the combination therapy of glucose intravenously and prednisolone trimethylacetate is ideally suited for routine treatment of field cases, because a rapid increase in blood glucose is achieved exogenously and not at the expense of the cow's tissues. In cows which had relapses following glucotherapy, combined treatment resulted in prompt recovery (chart 4).

SUMMARY

A new ester of prednisolone, prednisolone trimethylacetate (Ultracortenol), was reported to possess greater total therapeutic activity and a markedly greater duration of effect in laboratory animals.

Single doses of 50 to 500 mg., given to 9 normal cows, resulted in increased appetite,

slight depression of milk production, and a hyperglycemic state lasting from 12 to 48 hours.

In 19 ketotic cows given 50 to 500 mg. of prednisolone trimethylacetate as the only treatment, the optimal dose appeared to be 100 to 200 mg. Use of this dosage usually was followed by a reversal of the signs of ketosis within 48 to 96 hours.

In 15 ketotic cows given 50 to 200 mg. simultaneously with conventional carbohydrate therapy, the optimal dose to effectively correct ketosis appeared to be 50 to 100 mg.

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A Test of Trolene in Britain.—When Trolene (DOW ET-57) was given *per os* to 20 cattle, a total of 18 warbles developed in 4 of the 20 animals whereas there were 418 warbles in the 16 untreated controls. A technique for the implantation of the Hypoderma larvae, in experimental animals, is being developed so that such insecticides can be tested more efficiently.—*S. B. Kendall in Vet. Rec. (June 7, 1958): 486.*

A Diagnostic Test for Organic Phosphate Insecticidal Poisoning of Swine

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In an earlier paper,[1] a description of a simple and rapid color test as an aid in the diagnosis of anticholinesterase insecticidal poisoning of cattle was presented by this laboratory. The results showed that a lowered blood cholinesterase level coincided with signs of the poisoning.

However, the test as described for bovine blood was found to be unsatisfactory for swine blood. Hence, the original[2] and modified[3] tests for cholinesterase in human blood had to be varied for use in testing swine blood. In contrast to the three modifications required to test bovine blood, only a change in the incubation period was needed.

METHOD

The reagents and materials are the same as described[3] for the modified test for human blood. The only change in the procedure was that the incubation period was extended to 45 minutes.

RESULTS AND DISCUSSION

To adapt the test to swine, blood was obtained from healthy hogs and weanling pigs with no known previous exposure to an organic phosphate insecticide. It was found that to obtain the development of an amber color, indicative of normal cholinesterase activity, the reagents used in the modified test[3] could be used, but the incubation period had to be extended to 45 minutes.

Blood was obtained from pigs that were experimentally dosed with an organic phosphate insecticide. In every instance, the pigs had a definite lowered blood cholinesterase activity, as indicated by an olive-green or green color. In one set, signs of poisoning, such as shaking and increased

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From the Department of Animal Diseases, Georgia Coastal Plain Experiment Station, Tifton, Ga.

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salivation, corresponded with inhibition of the enzyme as indicated by the test.

As shown in the previous paper[1] on the use of this test for cattle, the advantages of the test for diagnosing organic phosphate insecticidal poisoning of animals are evident.

SUMMARY

The color test for blood cholinesterase, as previously described for use in the diagnosis of organic phosphate insecticidal poisoning of cattle, has been adapted to swine.

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Treating Lungworms Successfully

To test the efficacy of cyanacethydrazide (Imperial Chemical Indust., Ltd., Cheshire, England) against *Dictyocaulus viviparus* in cattle and *Dictyocaulus filaria* in sheep, two farms where these lungworms were prevalent, in Alberta, Canada, were selected for clinical trials.

On one dairy farm, many calves had died from lungworm infection and the survivors were too stunted to be kept for milking. Ten typically affected calves, 7 to 11 months old, were given 15 mg. of the drug per kilogram of body weight, either orally or subcutaneously, and the treatment was repeated at seven and 21 days. Three days after the first dose their appetites increased, coughing disappeared after the second treatment and, in a few weeks, all 10 seemed normal and thrifty; the third dose may not have been necessary. The oral and subcutaneous treatments seemed equally effective.

The flock of sheep selected consisted of 150 ewes and 60 lambs, most of them in extremely poor condition; 30 ewes had died in the past year and coughing was pronounced. Approximately half were treated subcutaneously and in two weeks the owner urged that the others be treated also. One ewe died but the others improved markedly in weight and condition.

There was a marked increase in the number of larvae in the stools of these animals three to four days after treatment, indicating that the drug might be a useful aid for diagnosis.—*J. G. O'Donoghue in Canad. J. Comp. Med. and Vet. Sci. (July, (1958): 237.*

Water Intoxication.—Although healthy persons can drink large quantities of water without ill effect, two instances are reported where acute delirium and convulsions followed the voluntary ingestion of massive volumes of water.

One person had taken very little food or drink for four days but, six hours before admission, he complained of unquenchable thirst and consumed glass after glass of water until he had a convulsion. Estimated water intake was in excess of 1 gal. Therapy consisted of intravenous infusions of hypertonic (5%) sodium chloride solution. During the first hour, the patient had two more generalized convulsions which were controlled with intravenous barbiturate.

Water intoxication can occur in normal persons when the rate of intake of a large volume of water temporarily exceeds the ability to maintain isotonicity of body fluids through prompt diuresis.—*J.Am. M.A. (July 26, 1958): 168.*

Staining Polymorphonuclear Leukocytes in Urinary Sediment.—A clinical diagnosis of pyelonephritis can be made without histological examination of renal tissue if a method is used that specifically stains polymorphonuclear leukocytes in urine sediment.

A 15-ml. tube of fresh urine is centrifuged for three to five minutes. The supernatant fluid is removed and one drop of solution A (cupric acetate 0.2%; nitric acid 0.054%; and dextrose 5.0%) is added and the sediment resuspended by tapping the tube. After allowing to stand four minutes, one drop of solution B (benzidine dihydrochloride 0.2%, to which, shortly before use, glycerite of hydrogen peroxide is added) is put in the tube and the sediment is well mixed and examined microscopically. When stained correctly, the polymorphonuclear leukocytes are greenish blue, indicating an active inflammatory process in the kidney which may be bacterial or nonbacterial in origin.—*New England J. Med. (June 26, 1958): 1301.*

Pulmonary Pathology in Dogs Due to Air Pollution

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Los Angeles, California

THE POSSIBILITY that air contaminants may have an adverse biological effect, even in the low concentrations which intermittently occur in urban areas, has been a matter of serious public health concern. In the Los Angeles area, the combination of geographic, meteorological, and industrial factors have made the problem one of particular gravity.

During the summer of 1957, a study was undertaken for the purpose of determining the presence, extent, and frequency of changes in the respiratory tracts in two selected groups of dogs. A correlation was sought between the frequency and intensity of air pollution and the development of specific pathological changes in the animals.

Unpublished studies by two of us (C.J.M. and P.K.) have demonstrated the presence of a series of changes in dogs exposed, in inhalation chambers, to a synthetic smog produced by the exposure of gasoline vapor to ozone in the presence of ultraviolet light. These morphological changes were used as the reference point for the assessment of any changes observed in the animals. Dogs were selected for this study because of the excellent opportunity for their identification by age and period of residence in a particular area.

METHODS AND RESULTS

Of the 51 dogs necropsied, 23 were obtained from the Pasadena Humane Society, which is in an area of relatively dense air pollution, 6 were procured from a veterinary hospital located near the Pasadena Humane Society, and 22 were obtained from the West Los Angeles Animal Shelter which is in an area of relatively light air pollution.

The areas were designated as being "densely" or "lightly" polluted on the basis of data obtained by the Los Angeles County Air Pollution Control District.

All of the dogs were taken to the respective animal shelters and the veterinary hospital by their owners with the request that they be euthanatized. A great majority had been in the possession of only one family for most of their lives. Those animals which were identifiable by age and period of residence were selected. The reasons for euthanasia included such factors as senility, unsuitable disposition, and changes in the owner's status, resulting in inability to maintain the pet. All of the dogs selected were ambulatory, reasonably active, and apparently free of acute illnesses.

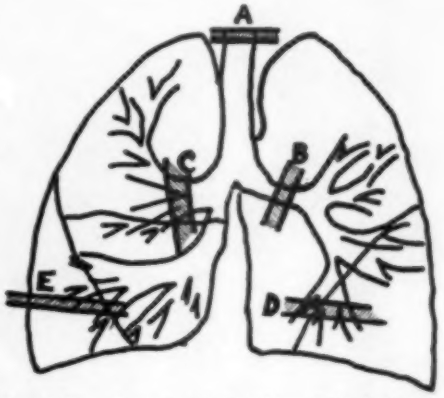


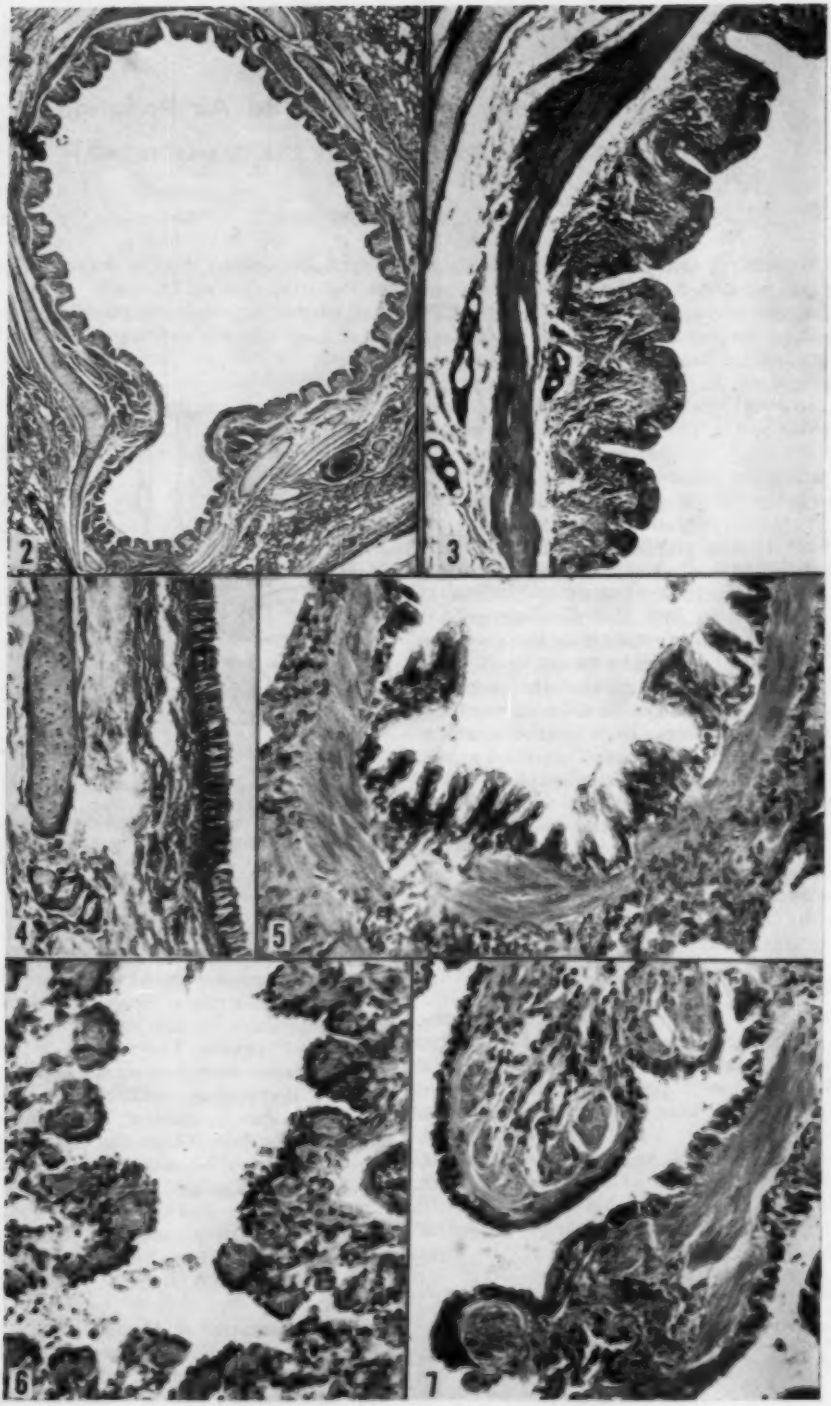
Fig. 1—The sites selected for histopathological study were: trachea (A); left main stem bronchus (B); right main stem bronchus and bronchi of second order (C); terminal bronchi, bronchioles, and alveoli (D); and bronchioles, alveoli, and subpleural areas (E).

The 51 dogs varied in age from 4 months to 18 years, with a mean age slightly over 6 years. Of the 31 males, 6 had been castrated; of the 20 females, 3 had been spayed.

The euthanasia of 45 dogs was accomplished by rapid decompression but, in the 6 animals obtained from the veterinary hospital in Pasadena, it was by intravenous injection of pentobarbital sodium. In all in-

From the Bureau of Chronic Diseases, California State Department of Public Health, assigned by U. S. Public Health Service, Los Angeles, Calif. (Catcott), and the Department of Pathology, School of Medicine, University of Southern California, Los Angeles (McCammon and Kotin).

Presented before the Section on Public Health, Ninety-Fifth Annual Meeting, American Veterinary Medical Association, Philadelphia, Pa., Aug. 18-21, 1958.



Figures 2-7

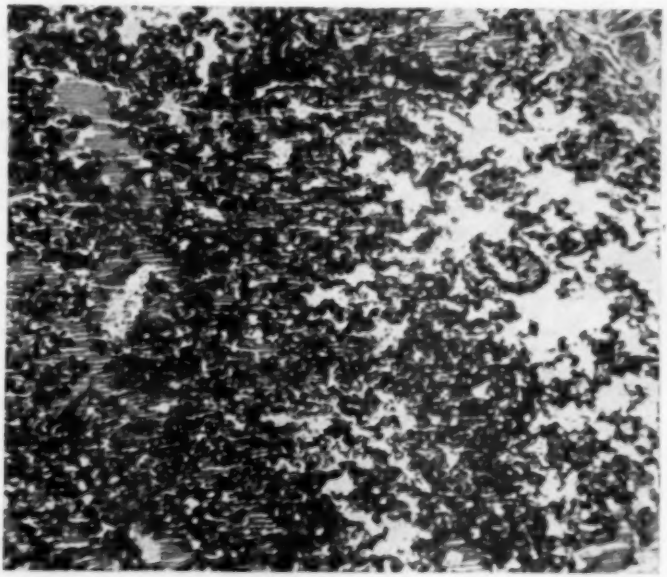


Fig. 8—Focal area of hemorrhage and edema limited primarily to alveolar levels. This change is a constant finding in animals subjected to euthanasia by decompression. x 125.

stances, the necropsy was done within two hours after death.

Necropsy Findings.—The visceral organs of the thoracic and abdominal cavities were examined grossly. All abnormalities in size, color, and consistency of organs were recorded. Sections of grossly abnormal areas were taken for histological examination. The respiratory tracts were removed *in toto*, beginning at a level immediately cephalad to the larynx. Specimens for histological study were obtained from five areas as shown (fig. 1).

Gross Findings.—The lungs obtained from dogs killed by rapid decompression showed a diffused redness over 5 to 70 per cent of the pleural surface of the pulmonary tissue. The consistency of the tissue was changed, with the lungs showing a uniform increase in firmness and weight.

Petechiae were frequently seen in the discolored regions which were usually located near the central portion of the lobes. The peripheral areas frequently, and the central areas occasionally, contained gray-

Legends for Illustrations on Opposite Page

Fig. 2—Section of trachea from a dog, showing no specific abnormalities. The papillary nature of the epithelium is a constant finding in dogs and probably represents postmortem contraction of elastic tissue. x 65.

Fig. 3—Higher magnification of part of the trachea shown in figure 2, showing essentially normal epithelium with cilia intact and goblet cell distribution with normal limits. x 425.

Fig. 4—Intact bronchial epithelium. Goblet cell activity appears to be somewhat increased. Notice absence of subepithelial vascular congestion and inflammatory cellular infiltration. x 500.

Fig. 5—Bronchiolar epithelium with marked thickening of basement membrane and peribronchial smooth musculature. Minimal cellular infiltrate may be noticed peribronchially. Included area of alveoli at margins of section are free of infiltrate. This finding has been observed in numerous dogs and appears to reflect age. x 450.

Fig. 6—Area of nonspecific pneumonitis, with bronchiolization of thickened alveolar septa. This finding is a nonspecific response seen frequently in a variety of mammalian species. x 125.

Fig. 7—Higher magnification of section from figure 6, showing cellular detail. x 500.

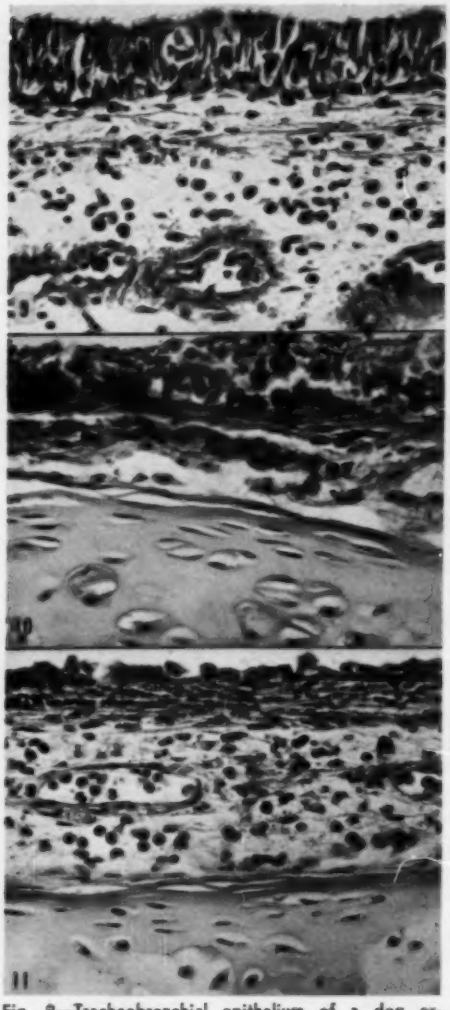


Fig. 9—Tracheobronchial epithelium of a dog exposed to synthetic smog in concentrations simulating natural conditions. Notice subepithelial, acute inflammatory, cellular infiltrate (stage 1 response). x 400.

Fig. 10—Tracheobronchial epithelium of a dog exposed to synthetic smog. Notice coagulation necrosis of epithelium (stage 2). x 400.

Fig. 11—Respiratory epithelium of dog with denudation of superficial epithelium. The basal layer of cells is essentially intact. Notice marked subepithelial cellular inflammation. x 400.

Figures 9 to 11 represent experimental exposure to synthetic smog consisting of ozonized gasoline in inhalation chambers with concentrations from 0.5 to 1.0 p.p.m. total oxidant for an average daily exposure of three to four hours for nine months.

ish white patches, which on cut surface were slightly elevated.

Lungs obtained from dogs killed with pentobarbital sodium had normal color and consistency.

The lungs of nearly all dogs older than 5 years were mildly discolored with dark particulate matter. This was observed equally among the dogs from Pasadena and West Los Angeles. The pigmentation was diffusely distributed throughout all the pulmonary lobes.

Gross examination of the tracheobronchial trees revealed no pathological changes. Pulmonary neoplasms, cysts, abscesses, and areas of fibrosis, though particularly sought for, were not observed.

Microscopic Findings.—Histological examination of the tracheobronchial epithelium, the peribronchial glands, and the pulmonary parenchyma revealed no uniform or consistent changes. The characteristic pattern of morphological changes observed in dogs exposed to synthetic smog in inhalation chambers was totally absent.

The changes produced in the experimental animals included increased activity of the mucous cells, focal areas of epithelial denudation, marked peribronchial and peribronchiolar cellular infiltration, and focal areas of an entity arbitrarily designated as smog pneumonitis. Representative sections from the tracheobronchial trees of dogs submitted for euthanasia and reported in this study are shown (fig. 2-8). Changes produced in the respiratory tracts of dogs exposed to synthetic smog for three to four hours daily for nine months are shown (fig. 9-11).

SUMMARY AND CONCLUSIONS

Fifty-one dogs were examined at necropsy within 24 hours after euthanasia. All the visceral organs were examined and appropriate sections from the tracheobronchial trees were taken for histological examination. The dogs were selected from two areas of Los Angeles County which have contrasting patterns of atmospheric pollution.

Findings in the dogs under study were contrasted with respiratory tract changes induced in other dogs by exposure to a synthetic smog in inhalation chambers. The subjects had been exposed to natural air pollution as it occurs in the Los Angeles area for periods varying from four months to 18 years. No characteristic or pathogno-

monic pattern of morphological changes in the tracheobronchial epithelium, subepithelial glands, or in the pulmonary parenchyma of the dogs under study could be detected.

Rabies Prophylaxis

A study was made to determine the efficacy of various methods of preventing rabies in exposed persons in southern India. The methods used were: (1) anti-rabies serum alone; (2) 5 per cent Semple vaccine; (3) a combination of serum and vaccine; and (4) high egg-passage, chicken embryo-adapted rabies vaccine with and without serum. Healthy guinea pigs weighing about 400 Gm. were used in the protection experiments. Mice were employed for serum-neutralization tests.

When anti-rabies serum was given alone, it definitely prolonged the incubation period but did not prevent development of rabies. With doses of 5 per cent Semple vaccine, it was possible to confer protection on animals against virulent strains of street virus provided the treatment was started seven days before challenge. Combined use of serum and vaccine after infection was of great value under certain conditions.

There appeared to be an optimum in the relationship between the quantity of serum and the antigenicity and dosage of vaccine administered. High egg-passage Flury vaccine given before infection gave good protection but serum and high egg-passage Flury vaccine administered after infection were not of value against an Indian strain of street virus.—*J.Am.M.A. (May 24, 1958): 505.*

Role of Brown Fat in Development of Bat Rabies.—That the brown (hibernating) fat plays a role in the pathogenesis of rabies in bats is indicated by studies on the progression of peripherally inoculated rabies virus. The virus may be retained in the brown fat of bats free of clinical rabies—another example of selective viral lipotropism.—*Vet. Bull. (June, 1958): Item 1768.*

Detecting Glaucoma Early.—Testing ocular tension by palpation through the lids is unreliable even in the hands of the experienced. The tonometer, which works on the simple principle that an eye with low tension dimples more easily than one with high intraocular pressure, can detect slight differences of pressure. To reduce the incidence of blindness due to glaucoma, a diagnosis should be made early and by means of tonometry.—*Brit. Med. J. (April 12, 1958): 881.*

A New Treatment for Glaucoma.—Cardrase (6-ethoxybenzothiazole-2-sulfonamide), a new potent carbonic anhydrase inhibitor, was given to 20 patients with various types of glaucoma. Dosage varied from 31 mg. given two or four times a day to 125 mg. twice a day. Treatment had to be discontinued by only two patients because of side effects such as nausea and weakness. The drug was effective in lowering ocular tension in glaucoma; it proved to be twice as potent and equally as well tolerated as acetazolamide.—*J.Am.M.A. (May 17, 1958): 402.*

Injudicious Use of Steroid-Containing Eye Drops.—The injudicious use of eye drops containing steroids can result in loss of vision and even in loss of the eye. Herpetic iritis, corneal necrosis, and corneal perforation, all rare complications in the past, have become more common since the advent of topical steroids.

The diagnosis of dendritic keratitis could easily be missed without the aid of a slit-lamp microscope and the unwise use of an antibiotic-steroid combination in this condition could lead to corneal necrosis and perforation. Fungal keratitis is known to follow the use of topical steroids in the eye. Of persons treated with topical cortisone for more than three weeks, 67 per cent have demonstrable fungi in the conjunctival sac.—*New England J. Med. (May 8, 1958): 946.*

Fluorescent Markers of Antibiotics in Milk.—Addition of a combination of fat-soluble fluorescein and uranine (sodium fluorescein) to antibiotic preparations, for intramammary infusion, can provide a rapid and satisfactory means for detecting antibiotics in the milk. These agents can be detected in the milk with the naked eye for 48 hours after treatment, and with ultraviolet light for 96 hours, by their bright green fluorescence. There was no evidence that they caused ill effects.—*J. Dai. Sci. (May, 1958): 617.*

Enzootic Ataxia from Copper Deficiency in Sheep in Colorado

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ENZOOTIC ATAXIA, a noninfectious disease of young sheep, is characterized by progressive locomotor incoordination, and is caused by copper deficiency. Although the disease has been observed and studied in many major sheep-producing areas, it has not been reported from North America. The purpose of this report is to record the occurrence of enzootic ataxia in sheep from two farm flocks in southern Colorado.

REVIEW OF LITERATURE

Enzootic ataxia has been observed and studied in Australia,[1-3] Britain,[9,11] New Zealand,[4-6] South Africa,[10] and South America.[11] Lambs from birth to 4 months of age may be affected. The incidence in affected flocks varies from low to 90 per cent of lambs born. The cause has been shown to be chronic copper deficiency in ewes during gestation. In one study, the dried livers of affected lambs contained a mean of 6.4 parts per million (p.p.m.) of copper, while those of normal lambs contained a mean of 241.0 p.p.m.[2,3]

In Australia[7] and New Zealand,[4-6] moderate to high intake of molybdenum enhanced the copper deficiency by accelerating the rate of copper excretion. The congenital cases were characterized by partial or complete paralysis,[9] whereas cases acquired postnatally showed a retarded growth rate and posterior muscular incoordination, followed by progressive ascending paralysis.[2,3]

Pathological changes were limited to the central nervous and skeletal systems and included extensive demyelinization of the cerebrum in animals with congenital cases[9] and demyelinization of the spinal cord and bone fragility in those with cases acquired postnatally.[3] Neuronal degeneration in the spinal cord was observed in some studies,[3,11] but not in others.[9] Although treatment of affected lambs was unsuccessful, progress of the disease was arrested by the administration of 7.5 mg. of copper, daily, per lamb.[3]

Enzootic ataxia was prevented by either of three methods of supplying copper to pregnant ewes: (*a*) oral administration to each ewe of three doses of 1.5 Gm. of copper sulfate per dose at two-week intervals during the midgestation period[3]; (*b*) the consumption by pregnant ewes of salt containing copper sulfate at the rate of 28 Gm. (1 oz.) per 100 ewes per week; (*c*) annual application of 51 lb. of crushed copper sulfate per acre of pasture.[3]

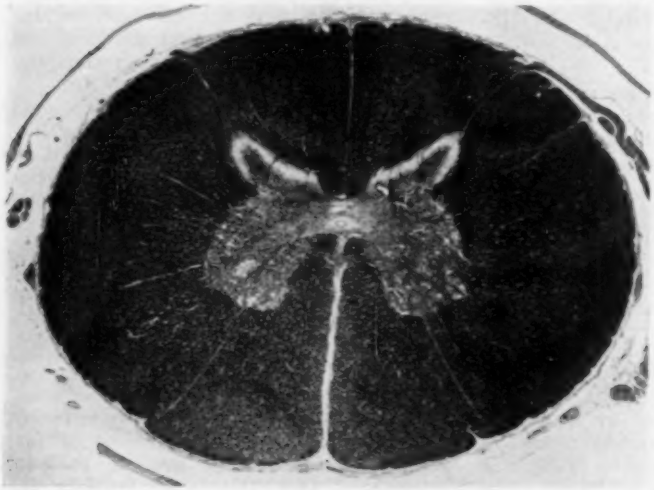

Fig. 1—Cross section of cervical spinal cord of a normal lamb. Weil's stain; x 12.

TWO AFFECTED FLOCKS IN COLORADO

The two affected flocks of sheep were maintained on adjacent farms near the city of La Jara, in southern Colorado.

From College of Veterinary Medicine and Agricultural Experiment Station, Colorado State University, Fort Collins.

Assistance from Dr. Decker Haynie, La Jara, Colo., is acknowledged.

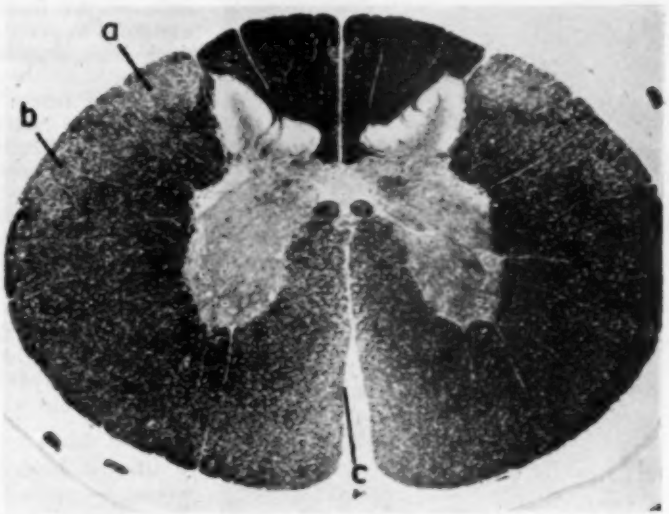

Fig. 2—Cross section of cervical spinal cord from lamb affected with enzootic ataxia, showing demyelinization of dorsolateral tract (a); dorsal spinocerebellar tract (b); ventral corticospinal tract (c). Weil's stain; x 12.

Flock A consisted of approximately 110 crossbred Rambouillet ewes which were maintained continuously on the farm. Their ages varied from young to old since ewe replacements were selected annually from the lamb crop. On successive seasons, different rams were used for breeding.

Farm crops consisted of alfalfa, barley, potatoes, clover, and grass pasture. During summers, the ewes grazed on pasture and

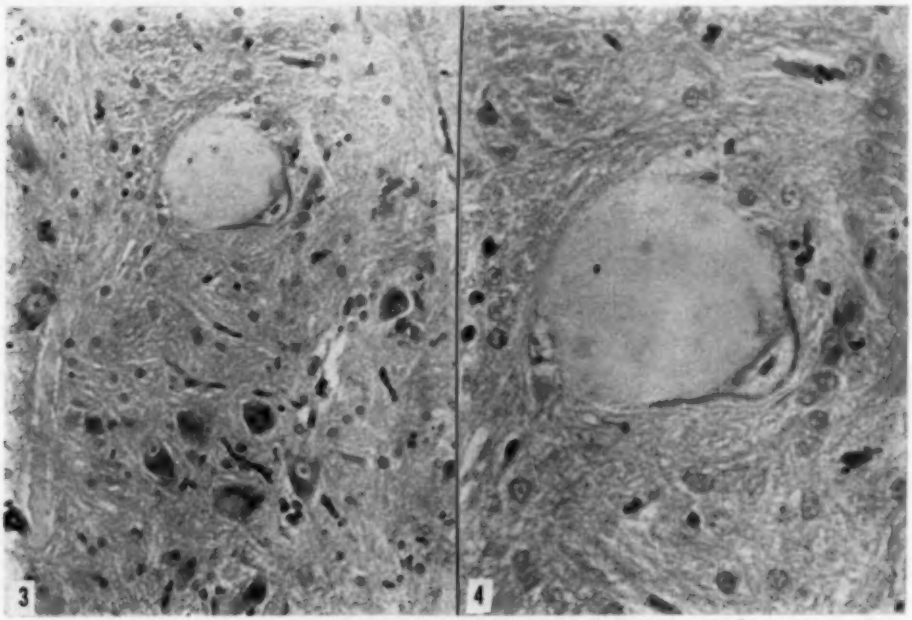

Fig. 3—Spinal cord of a lamb affected with enzootic ataxia. A degenerated neuron is above and normal neurons are below. Nocht's stain; x 187.

Fig. 4—The same degenerated neuron shown in figure 3. Nocht's stain; x 374.

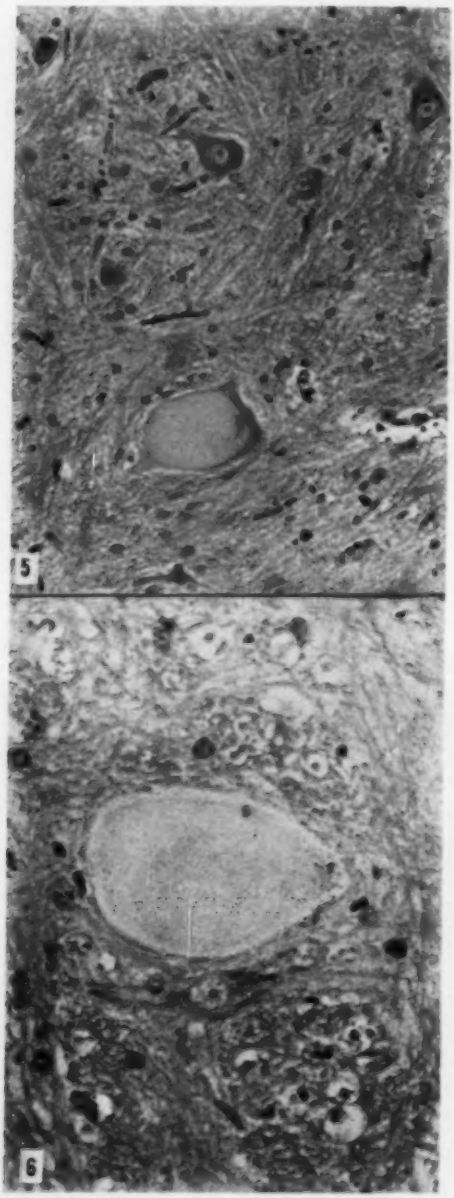

Fig. 5—Spinal cord of lamb with enzootic ataxia. Normal neurons are above and a degenerated neuron is below. Nocht's stain; x 178.

Fig. 6—Medulla oblongata of lamb with enzootic ataxia. A normal neuron is below and a tremendously enlarged and degenerated neuron is above. Nocht's stain; x 374.

fields of the farm. During winters, they continued to graze and were fed alfalfa and some grain supplement. Lambing occurred in April.

Affected lambs were first observed in 1951 when 5 lambs showed signs of enzootic ataxia. During the successive five years the incidence increased progressively until approximately 50 per cent of the lambs of both sexes were affected.

Flock B resembled flock A in every way, including breeding, feeding, and management, except for two differences: (*a*) The majority of the ewes were 7 years old and had been on the farm for five years; and (*b*) the disease did not appear until the lamb crops of 1956 and 1957, each crop having 6 lambs with enzootic ataxia.

Clinical Signs

Affected animals varied from a few weeks to approximately 4 months of age. They showed muscular weakness and incoordination which began in the hindlegs and progressed to include the forelegs. Ambulation was abnormal and was accomplished with lateral oscillations and hopping movements of the hindlimbs. The lambs preferred to remain recumbent but their temperatures and appetites remained normal.

In early stages, signs of the disease were not present during rest and moderate activity but were often provoked by driving and other forced activities. In advanced stages, affected lambs tended to remain recumbent and always manifested the peculiar gait during ambulation. In terminal stages, motor paralysis of the limbs caused continuous recumbency.

The hemoglobin of ewes, normal lambs, and affected lambs was normal. Their wool was also normal.

Although many affected lambs died from emaciation and intercurrent diseases, mildly affected animals were fattened and marketed.

Pathological Changes

At necropsy, no gross primary organic alterations were discernible.

Histopathological changes were limited to the central nervous system. In the spinal cord, changes were prominent in the cervical and thoracic segments. Demyelinization was bilateral and present in the dorsolateral tracts, dorsal spinocerebellar tracts, and ventral corticospinal tracts (fig. 1,2).

Neuronal degeneration, although not abundant, occurred in some cells in the spinal cord, medulla oblongata, and thalamus of all affected lambs. In the spinal cord, degenerated neurons were in the ventral horns and in the cervices of the dorsal horns. Affected cells were enlarged by as much as a factor of 5. The cytoplasm showed tigrolysis and eosinophilic homogeneity. In some cells the nuclei were eccentric but apparently viable; in other cells with advanced changes the nuclei, axones, and dendrites were absent (fig. 3-8).

The copper and molybdenum content of the liver was determined (table 1) for 3 lambs affected with enzootic ataxia and for 10 comparable normal lambs from northern Colorado.

TABLE 1—Copper and Molybdenum in Dried Livers of Normal Lambs and Those with Enzootic Ataxia

Lambs—normal			Lambs—enzootic ataxia		
No.	Copper (p.p.m.)	Molybdenum (p.p.m.)	No.	Copper (p.p.m.)	Molybdenum (p.p.m.)
1	240	20	11	15	65
2	226	18	12	12	51
3	201	29	13	11	36
4	216	17	....	....	....
5	248	27	....	....	....
6	212	16	....	....	....
7	192	14	....	....	....
8	186	22	....	....	....
9	218	18	....	....	....
10	206	20	....	....	....
Mean	214.5	20.2		12.7	50.7

DISCUSSION

The metabolism of copper, molybdenum, and inorganic sulfates is interrelated.[7,8] High dietary intake of molybdenum reduces hepatic stores of copper. Low intake of inorganic sulfate results in high blood level and hepatic storage of molybdenum.

Copper deficiency may be simple and result from inadequate intake of that element or may be complicated and result from excessive intake of molybdenum. While hepatic stores of molybdenum were higher in the Colorado lambs affected with enzootic ataxia than in normal lambs, the precise cause of the copper deficiency was not determined.

SUMMARY

Enzootic ataxia occurred in two flocks of sheep on adjacent farms of southern Colorado. The clinical signs were progres-

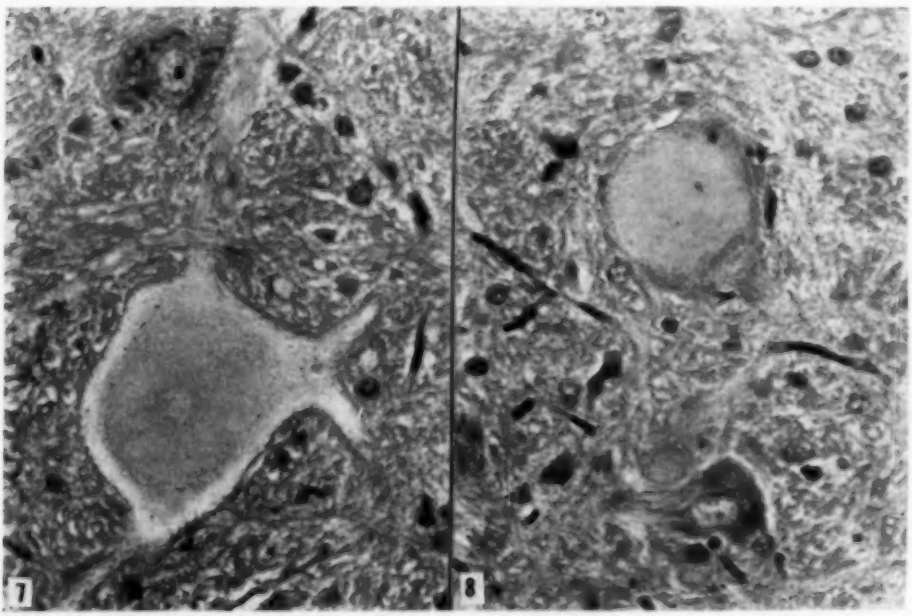

Fig. 7—Thalamus of a lamb with enzootic ataxia. A normal neuron is above and an enlarged, necrotic neuron is below. Nocht's stain; x 374.

Fig 8.—Thalamus of a lamb with enzootic ataxia. A normal neuron is below and a degenerated neuron is above. Nocht's stain; x 374.

sive locomotor incoordination which began in the hindlimbs and progressed to the forelimbs, terminating in paralysis of the limbs. Pathological changes were spinal cord demyelinization of the dorsolateral, spinocerebellar, and ventral corticospinal tracts, and neuronal degeneration and necrosis in the spinal cord, medulla oblongata, and thalamus.

Chemical analysis of dried liver showed a mean copper content of 12.7 parts per million (p.p.m.) and a molybdenum content of 50.7 p.p.m. for lambs with enzootic ataxia, and a mean copper content of 214.5 p.p.m. and a mean molybdenum content of 20.2 p.p.m. for comparable normal lambs.

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Enterotoxemia of Sheep

Clostridium welchii type D commonly inhabits the alimentary tracts of animals but the disease can not be reproduced even with large quantities of this culture while the animals are on a normal ration, such as hay. This may be due to the absence of large quantities of fermentable substrate; to the rapid flow of the intestinal content which soon removes accumulations of bacteria and toxin; or because the toxin is not easily absorbed.

The disease can be reproduced consistently if the ration is changed suddenly and large quantities of rich feeds such as wheat are eaten before the culture is introduced. In these circumstances, the rumen flora can not adapt rapidly enough to prevent the escape of undigested or partly digested feed into the small intestine, thus providing an ideal substrate for the organism. Also, high concentrations of the toxin and possibly of other metabolic products of the bacteria increase the permeability of the intestine, resulting in absorption of the toxin and acute enterotoxemia.

The disease may be prevented by avoiding sudden changes of ration, preventing sheep from overeating, and by vaccination. —*Vet. Bull. (May, 1958): Item 1377.*

Polioencephalomalacia in Sheep

In May, 1957, complete to partial blindness occurred, without eye lesions, in 30 to 40 wethers in a flock which had been pastured for nine months. Some affected animals would push their heads against objects; others remained alert. All recovered completely in four to six weeks, except 3 which were taken for study and necropsy.

Numerous foci of noninflammatory necrosis of the neurones in the deeper layers of the cerebrocortical gray matter were the only microscopic lesions found.

In a second flock of 120 yearlings, 10 per cent were similarly affected. The condition had not previously been reported in New Zealand. It is suggested that the lesions may result from neurotoxic action of sublethal levels of *Clostridium welchii* type D toxin.—*J. Mullins et al. in New Zealand Vet. J. (April, 1958): 52.*

[Polioencephalomalacia in cattle and sheep has been reported from Colorado—JOURNAL, Oct. 1, 1956: 311.]

Veterinary Medicine—The Publication

The recent untimely death of Bob Anderes, the energetic, progressive publisher and editor of our sister journal, *Veterinary Medicine*, causes us to pause and review the unique and important service of that publication to our profession.

Starting in 1905, as the monthly *Iowa-Nebraska Veterinary Bulletin*, for practitioners, it was purchased by Dr. D. M. Campbell, in 1910, and thereafter published in Chicago as the *American Journal of Veterinary Medicine*. In 1910 (5 years before the *American Veterinary Review* was acquired and published as the JOURNAL of the AVMA), it had a record circulation for an American veterinary publication of 2,200. Ten years later, the name was shortened to *Veterinary Medicine*.

In 1949, it passed to the control of Dr. Robert L. Anderes and since then has been published in Kansas City, Mo.

To quote from the splendid 50th Anniversary Issue, of November, 1955 (p. 501):

"The progress of *Veterinary Medicine*, the magazine, closely parallels the progress of veterinary medicine, the profession. They have literally grown up together."

That this growth period saw some radical changes can be illustrated by a single statistical comparison, e.g., in 1910 there were in this country 28,273,000 horses and mules valued at $3,268 million vs. 22,774,000 dairy cattle valued at $815 million. Today, with more efficient production, there are 10 per cent fewer dairy cows but the number of horses and mules has shrunk to 3,273,000 (88% fewer). The value of all horses and mules has dropped from four times to about one twelfth that of all dairy cattle.

THE PATTERN FOR SUCCESS

That *Veterinary Medicine* has continuously been a solid success as a private journalistic venture has been due chiefly to its sustained contact with and understanding of the problems of a large majority of veterinary practitioners.

In its early years, even the nongraduates, who were practicing with what might have been called "squatters" licenses, profited from the sometimes crude but interesting and practical articles published.

Featured sections, such as page after page of brief "Case Reports" and "Queries and Answers," and individual pages of notes, such as "Purely Practical" and "Zootechnique Notes," were popular with all practitioners.

As the type and training of veterinarians changed, *Veterinary Medicine* gradually published more scientific articles. This ability to keep a few jumps ahead of changes in its "clientele" was due chiefly to the talent of its capable editors to maintain their grass roots contact with practitioners. They regularly attended conventions and were guided in their choice of articles, by the current popularity of the subjects. They frequently requested speakers, whose papers were well received, to submit them for publication. They understood public relations among veterinarians.

A WELL-STATED TRIBUTE

This characteristic was eloquently described by the editor of the *British Veterinary Journal* who stated, in the 50th Anniversary Issue of *Veterinary Medicine* (p. 510):

"In the early days most of the veterinary material recorded the personal observations and conceptions of those who practiced their profession in the field. Now many of the articles set forth the results of experimental tests recorded with scientific precision. Whilst one must be deeply conscious of all that we owe to the scientific workers in the laboratories, one can not but regret that the ink in the clinician's pen seems to have dried up in almost exact proportion to the flux of those wielded by the research workers. . . . *Veterinary Medicine* seems to be able to keep a fair balance between . . . material . . . of clinical and laboratory origin."

We of the JOURNAL appreciate the excellent long range contribution of *Veterinary Medicine* and would like to believe that it and the JOURNAL of the AVMA have more or less complemented each other. We have advantages, but also obligations, that it does not have.

We recognize *Veterinary Medicine* as a worthy competitor and as a valued journalistic colleague. May it continue to serve the profession and to prosper in the future, even more, if possible, than it has in the past.

Current Literature

ABSTRACTS

Serum Transaminase in White Muscle Disease

In 14 lambs with artificially induced white muscle disease and in 17 lambs with naturally occurring cases, increased serum glutamic oxalacetic transaminase (SGOT) levels, 25 to 170 times normal, occurred. Calves with both the skeletal and cardiac types of white muscle disease showed an average SGOT level of 524 units per milliliter. No difference in SGOT levels was observed between the skeletal and cardiac types of white muscle disease in calves. Normal SGOT level in lambs was 56 ± 31 units per milliliter and, for calves, 56 ± 17 units per milliliter.

Increased SGOT values occurred prior to the development of symptoms in 4 lambs with artificially induced white muscle disease.

Some normal-appearing animals in affected flocks and herds also had moderate elevations of the transaminase values. Control animals from flocks and herds with no histories of white muscle disease had uniformly low transaminase values.—[*Kenneth L. Kuttler and Donald W. Marble: Relationship of Serum Transaminase to Naturally Occurring and Artificially Induced White Muscle Disease in Calves and Lambs. Am. J. Vet. Res., 19, (July, 1958): 632-636.*]

Resin-Agglutination Test for Vesicular Stomatitis

A good correlation was observed between the serum-neutralization and the resin agglutination-inhibition titers of 43 serums with antibodies to vesicular stomatitis virus. Resin-agglutination titers of tissues and fluid from chicken embryos inoculated with vesicular stomatitis virus indicated that the viral antigen was more abundant and appeared earlier in the embryo than in the choriallantoic membrane or the allantoic fluid. No correlation was found between infectivity and resin-agglutination titers.

A marked cross-reaction between the two immunological types of vesicular stomatitis virus was observed. Treatment of the virus with heat or formalin destroyed its infectivity but not its antigenicity as detected with the resin-agglutination test.

The possibility was discussed that the viral antigen detected by the resin-agglutination test might be separated from the infectious viral particles.—[*F. M. Nieto and D. Segre: The Resin-Agglutination Test for Vesicular Stomatitis. Am. J. Vet. Res., 19, (July, 1958): 761-764.*]

Effects of Stilbestrol on Calves

Diethylstilbestrol (stilbestrol) was given to yearling heifers, heifer calves, and bull calves for approximately five months to determine any abnormalities in the reproductive organs or in sexual behavior attributable to the treatment.

Yearling heifers showed no differences in the frequency and duration of estrus or in fertility. Estrogenic assays indicated that over 40 per cent of the estrogen equivalent of stilbestrol intake was eliminated in the feces.

Stilbestrol seemed to hasten and accentuate the the onset of puberty in heifer calves. However, no observable consequences, as measured by semen evaluations and comparisons of testicular size, were observed in treated bull calves.—[*H. W. Reuber: Effects of Diethylstilbestrol Feeding on the Bovine Reproductive Tract. Am. J. Vet. Res., 19, (July, 1958): 585-590.*]

Electrocardiographic Studies in Dairy Cattle

Systematic unipolar exploration of thoracic perimeters, esophagus, rumen, and the right side of the heart, in 12 unrelated animals, was used in defining the nature of the spread of the impulse in the bovine heart.

One "precardial" lead, selected on the basis of the unipolar study, was compared with leads I, II, and III in 25 sets of identical twins and in 45 unrelated animals, as regards reproducibility. There was discordance in general reference to QRS and T. The QRS potentials, in general, tended to have opposite polarity with reference to analogous locations in man and the dog. An entirely different pathway of activation must occur in cattle. Heart position and conduction characteristics in this species would appear to be such that marked variability from animal to animal occurs in the "standard" bipolar limb leads. Selected electrode locations may more reproducibly represent auricular and ventricular potentials; one bipolar chest lead is described which appears to have promise for general use.—[*A. F. Sellers, A. Hemingway, E. Simonson, and W. E. Petersen: Unipolar and Bipolar Electrocardiographic Studies in Dairy Cattle. Am. J. Vet. Res., 19, (July, 1958): 620-624.*]

Blood Calcium in Bovine Ketosis

In cows with uncomplicated ketosis, the serum calcium has been found to be lowered significantly when the level of total acetone bodies in the blood is above 45 mg./100 ml. When blood acetone was above this value, the average serum calcium was 8.8 mg./100 ml., as compared with 10.04 mg./100 ml. for control animals. The difference was found to be significant at the 0.1 per cent level of probability. In 3 animals, serum calcium returned to normal while blood acetone still was markedly elevated. This coincided with the disappearance of clinical signs of disease and recovery of the appetite.

Based on experience from short-time hunger experiments, the theory is advanced that the hypocalcemic tendency in animals with ketosis is due to reduced feed intake.

Serum calcium was found to be positively correlated with blood sugar. Serum magnesium was not found to be systemically changed in ketotic animals.—[*Karl Halse and Weiert Velle: Blood Calcium in Bovine Ketosis. Am. J. Vet. Res., 19, (July, 1958): 575-579.*]

Infectious Canine Hepatitis

The intranuclear inclusion bodies in the hepatic parenchymal cells of pups experimentally infected with infectious canine hepatitis virus were studied by electron microscopy. They were identified readily in thin sections under the electron microscope, because their appearance resembled that observed by light microscopy.

The inclusion bodies were composed of numerous viral particles and an amorphous matrix. The average diameter of the particles was approximately 65 mμ in sections from which the embedding plastic was not removed, and approximately 71 mμ in shadowed preparations.

The particles could be divided into three types —uniformly dense particles, those containing a dense central body, and those with transparent cores.

The matrix appeared to have been derived mostly from chromatin and to have been utilized for viral particle formation.—[*Masanori Tajima and Tsunemasa Motobashi: Electron Micrographs of Intranuclear Inclusions in Hepatic Cells of Dogs with Infectious Canine Hepatitis. Am. J. Vet. Res., 19, (July, 1958): 666-674.*]

BOOKS AND REPORTS

The Alimentary Tract of the Ruminant

The book consists of a limited number of pages which discuss the development of the four compartments of the ruminant stomach and of the small and large intestines. These are followed by a review of the process of ingestion and movements of the organs as the ingested material passes down the alimentary tract.

The body of the book is a series of radiographs and selected frames from a film showing a sequence of movements. Through the use of such film, it was possible to rerun the sequence and study it repeatedly.

Using barium sulfate in the usual manner, it was possible to record the first meal of milk, and many succeeding ones. Studies were made on lambs, kids, calves, and small but mature sheep and goats.

The movement of milk, cereal, hay, and of a mixture of cereal and hay could be studied by the techniques used, and the authors have recorded movements not previously described because they have never been clearly observed.

The book should be useful to the veterinarian whose practice includes ruminant patients, as well as to physiologists and anatomists. One practical observation was that in a study of twin calves, the gruel ingested by one was deposited in the abomasum as expected, while the gruel ingested by the other was deposited in the rumen and reticulum, which was not expected. The latter calf developed much less rapidly than the former.—[*The Alimentary Tract of the Ruminant. By David Benzie and A. T. Phillipson. 24 pages; 53 plates. Charles C Thomas, Springfield, Ill. 1957. Price $5.50.*]—R. C. KLUSSENDORF.

Veterinary Drug Encyclopedia and Therapeutic Index

The sixth edition of this encyclopedia contains sections on (1) drugs, biological products, and foods, with a description of each product, its action and uses, methods of administration, how supplied, and the name of the supplying company; (2) cat and dog foods, with an analysis of each of the ten described; (3) feed additives, describing the basic formulations of the major feed manufacturers; (4) a manufacturers' index, listing the source of supply of veterinary drugs; and (5) a therapeutic index which gives the drugs under their various classifications.

Veterinarians will find this book a valuable reference tool.—[*Veterinary Drug Encyclopedia and Therapeutic Index. Edited by Hadley C. Stephenson and Stanley G. Mittlestaedt. 412 pages; paper bound. Drug Publications, Inc., New York, N.Y. 1958. Price not given.*]

Listeriosis (Listeriosen)

This publication, as a supplement of the journal *Zentralblat für Veterinärmedizin*, consists of 11 papers about Listeria infections presented at a symposium sponsored by the University in Giessen, Germany. It brings up the recent experience and development in listeriosis pertaining to both man and animals. The first papers deal with morphological and cultural characteristics of *Listeria monocytogenes*. Others discuss serological studies and serodiagnosis of listeriosis. Further papers are devoted to the pathological anatomy and pathogenesis of listeriosis; still others to listeriosis in man and animals.

The paper "Experimental Listeriosis in Pregnant Animals" has been written in English, others are in German, but each one has an English summary. —[*Listeriosis (Listeriosen). By E. Roots and D. Strauch. 116 pages; 15 illustrations. Paul Parey, Berlin, Germany. 1958. Price about $3.50.*]—F. KRAL.

Plants Poisonous to Livestock in the Western States

This excellent bulletin, illustrated with color plates and sketches, deals with poisonous plants in the western states. It should be useful to veterinarians working west of the Mississippi River.—[*Sixteen Plants Poisonous to Livestock in the Western States. 49 pages. U.S.D.A., Farmers' Bulletin No. 2106, Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C. April, 1958. Price not given.*]

Bibliography of Avian Mycosis

This partially annotated collection of 521 references on fungus diseases of birds would be of value to anyone who works with the mycoses.—[*A Bibliography of Avian Mycosis. By H. L. Chute and D. C. O'Meara. 81 pages. Maine Agricultural Experiment Station, Orono, Maine. Oct., 1957. Price not given.*]

THE NEWS

Eighty-Sixth Annual Meeting of the American Public Health Association

The American Public Health Association announced Aug. 10, 1958, that its eighty-sixth annual meeting in St. Louis, Mo., October 27 to 31, will feature reports on progress being made by the voluntary and governmental agencies toward solving the major health problems facing mankind.

More than 4,000 health authorities from the Americas and other parts of the world are expected to attend. Forty related organizations are scheduling sessions during the same week.

Berwyn F. Mattison, M.D., the association's executive secretary, discussed the program as "reflecting the tremendous range of current public health research. . ." Much interest, he feels, will be centered on a morning session, October 29, dealing "with ionizing radiation and atmospheric pollution."

Among the many subjects included on the program will be sessions on epidemiology, food and nutrition, the laboratory, occupational health, and public health education. The scientific sessions will be held in Kiel Auditorium, where the scientific and technical exhibits will be displayed.

Registration for scientific sessions will be opened to all interested persons. Local arrangements are being made by a committee headed by J. Earl Smith, M.D., St. Louis Health Commissioner.

American Public Health Association Creates Five New Staff Positions

The American Public Health Association, as part of a long-range expansion and reorganization to help communities cope with new and changing health needs, has filled five newly-created key staff positions, according to a recent announcement by Berwyn F. Mattison, M.D., executive secretary.

Thomas Hood, M.D., M.P.H., formerly executive secretary of the Kansas State Board of Health since 1951, has been named associate executive director, effective last August 1.

Effective September 1, James L. Troupin, M.D., M.S.P.H., became associate director assigned to the association's committee on professional education. Formerly, he had been engaged in similar work with the World Health Organization in Geneva, Switzerland.

Chief of the legislative unit of the National Tuberculosis Association since 1951, Noble Swearingen joined the A.P.H.A. on June 1, as director of its recently created Washington office, which will also serve as liaison office with affiliated societies in the southern region of the country.

Robert Mytinger, M.P.H., formerly secretary of the public health committee of the Paper Cup and Container Institute, will be the first director of the A.P.H.A.'s recently recreated Western Regional Office in San Francisco, effective last August 11.

Edward Wellin, Ph.D., research associate at the Harvard School of Public Health in the field of social anthropology, will serve as chief investigator for a three-year study on the relation between public health and the behavioral sciences, to be conducted under a grant from the National Institute of Mental Health. He joined the staff September 1.

Major support for the reorganization and expansion program has come from the Rockefeller Foundation and the W. K. Kellogg Foundation, each of which has granted the association $150,000 for this purpose.

Courses at Communicable Disease Center Offered During 1958-1959

The United States Public Health Service is offering an extensive number of courses in communicable disease control and related subjects at the Communicable Disease Center in Atlanta, Ga., between September, 1958, and June, 1959.

Among the subjects scheduled are:

October 6-10—Laboratory Methods in the Diagnosis of Rabies. Course 826, Chamblee, Ga.

October 6-17—Tests for Syphilis Using Treponemal Antigens. Course 452, Chamblee, Ga.

October 13-24—Laboratory Methods in the Diagnosis of Viral and Rickettsial Diseases. Course 820, Montgomery, Ala.

October 13-31—Laboratory Methods in the Diagnosis of Parasitis Diseases. Part 2.—Blood Parasites. Course 801, Chamblee, Ga.

October 20-24—Epidemiology and Control of Milk-Borne Diseases. Course 331.

November 12-14—Milk Pasteurization Controls. Course 231.

Complete descriptions of the courses listed above appear in the *CDC Training Program Bulletin*, as well as descriptions of the many other courses being presented during the year. All state and local health departments have copies of this bulletin.

Further information and application forms may be obtained by writing to: The Chief, Communicable Disease Center, U. S. Public Health Service, 50 Seventh St., N.E., Atlanta 23, Ga.

General Research Training Grants Program

A new program to increase the number of trained scientists for research and academic careers in fields of basic importance to health was announced recently by the Public Health Service.

Designed to provide aid for graduate level training in medical schools, universities, and other qualified training institutions, the new program will be financed through the Service's National Institutes of Health and will be known as the "General Research Training Grants Program."

"Additional trained research personnel are badly needed," said Dr. James A. Shannon, director of the Institutes, "in such shortage areas as pathology, pharmacology, genetics, anesthesiology, epidemiology, biometry, biochemistry, biophysics, and others from which come new basic knowledge vital to the conquest of disease."

Institutes receiving funds under the new program will select individuals for predoctoral and postdoctoral training. The institutions will determine stipends to be paid. They are not restricted to a set pattern in developing training, but may propose programs of any nature which reflect research training needs as seen by the institutions and which provide the best utilization of their facilities.

Institutions wishing further information, including application forms and instructions, may obtain them by writing to the Chief, Research Training Branch, Division of Research Grants, National Institutes of Health, Bethesda 14, Maryland.

Armed Forces Institute of Pathology to Hold Postgraduate Course for Fifth Year

A postgraduate course on "Pathology of Diseases of Laboratory Animals" will be conducted for the fifth time at the Armed Forces Institute of Pathology, Dec. 8-12, 1958. A portion of the subject matter previously presented will be repeated.

The course is designed to provide training for professional officers who are responsible for the recognition and interpretation of lesions of experimental animals or who have charge of procurement and maintenance of animal colonies. It is intended particularly to help them interpret natural diseases which may negate experimental results or influence the supply of laboratory animals, or their suitability for experimental use.

Aimed especially at the needs of various Army, Navy, and Air Force laboratories, pathology will be the theme of the course but this facet will be used as a point of departure for discussion of etiology, diagnosis, and control of the diseases under consideration.

Special attention will be paid to conditions which may affect the suitability of laboratory animals or may alter or interfere with experimental results. Laboratory officers, veterinarians, and others with similar professional backgrounds should find the course of value.

A limited number of vacancies are available for civilian veterinarians. Applications for enrollment should be addressed to: The Director, Armed Forces Institute of Pathology, Washington 25, D.C.

Colonel Mohri Awarded the Legion of Merit

U.S. Army

The Legion of Merit with first Oak Leaf Cluster was recently awarded to Col. Ralph W. Mohri (left), Army Veterinary Corps, for "exceptionally meritorious conduct in the performance of outstanding service." Making the presentation during a ceremony at Second Army Headquarters was Major Gen. Rinaldo Van Brunt, chief of staff for the Second Army.

Retiring after 28 years of service, Colonel Mohri had been director of the Department of Veterinary Medicine, Army Medical Service School; assistant chief, Veterinary Division, Office of the Surgeon General; and more recently staff veterinary officer, Second Army Headquarters.

Wanted by FBI—Man Masquerading as Veterinarian

John Allen Seybold, with following aliases: John Allan Seybold, Jack Seybold, John Edwin Abbott, John Allen, Jack Barne, J. Cole, J. L. King, John Allen Taylor, Dr. James E. Lynde.

Fugitive—Interstate Transportation of Stolen Motor Vehicle

John Allen Seybold is being sought by the Federal Bureau of Investigation for the crime of Interstate Transportation of a stolen motor vehicle. Seybold, while in Chicago, in 1956, masqueraded as a veterinarian. He claimed his name was Dr. James H. Lynde, a veterinarian, and operated on a prize Collie owned by a Chicago woman.

This woman called a veterinarian to exam-

John Allen Seybold

ine her dog and Seybold, posing as Dr. Lynde, suddenly appeared at her door. She has no idea where Seybold came from. The woman also advised that Seybold apparently knows a great deal about veterinary medicine and was successful in operating on her Collie.

In 1957, Seybold, after being away from Chicago for a few months, worked at this same Chicago woman's kennels in Wauconda, Ill.

On September 11, 1956, a complaint was filed before United States Commissioner, Buffalo, N.Y., charging Seybold with violation of the interstate transportation of a stolen motor vehicle, in that he transported in foreign commerce from Buffalo, N.Y., to Toronto, Ont., Can., a 1953 Dodge automobile knowing it to be stolen.

A warrant was issued the same date at Buffalo. Seybold has been known to carry a revolver in a shoulder holster and should be considered armed and dangerous. He has been previously sentenced for issuing checks with the intent to defraud. He is also wanted by the Chicago Police Department and the Cook County state attorney's office concerning a receiving and a bad check charge.

He was born June 17, 1924, Cleveland, Ohio; height—5 ft. 11 in.; weight—190 pounds; build—medium; hair—black; eyes—brown; complexion—dark; race—white; nationality—American; occupation—salesman and kennel attendant; characteristics—sometimes wears glasses, and uses nitroglycerin pills for a heart condition.

Any person having information which might assist in locating this fugitive is requested to notify: The Director of the Federal Bureau of Investigation, United States Department of Justice, Washington 25, D. C., or the special agent in charge of the nearest Federal Bureau of Investigation Division, the telephone number of which may be found on the first page of local telephone directories.

AMONG THE STATES AND PROVINCES

Alabama

During Auburn's annual veterinary conference held July 21-24, 1958, three of the profession's top administrators conferred with Dr. R. E. Rebrassier, then president-elect and now, president of the AVMA. Left to right—Drs. E. H. Durr, Jackson, Miss., president, Southern V.M.A.; T. M. Miller, Dothan, president, Alabama V.M.A.; R. E. Rebrassier, Columbus, president-elect, AVMA; and J. E. Greene, Auburn, dean, School of Veterinary Medicine, Alabama Polytechnic Institute.

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The Bailey Family—A Veterinary-Minded Clan.—Twenty years ago, Mrs. Bessie Bailey, widow of O. W. Bailey, post office employee and businessman, and her three children left Hartsville, Ala., and their 40-acre farm for Auburn, determined to help her son get an education in veterinary medicine.

Today, she not only has a son who is a veterinarian but also two sons-in-law who are veterinarians and eight veterinary-minded grandchildren. To accomplish this, Mrs. Bailey operated a boarding house, principally for veterinary students. In 1942, she became joint telephone operator and mail clerk at the Alabama Polytechnic Institute. Today, she is chief college telephone operator, having served in that capacity for 13 years.

Mrs. Bailey's oldest daughter, Mrs. Harold Nance, was secretary to the late Dr. R. S. Sugg, dean of the School of Veterinary Medicine, and she became so interested in veterinary medicine that she encouraged her husband, Harold (API '44), to study for the D.V.M. degree. Today, Dr. and Mrs. Nance reside in Lawrenceburg, Tenn.

Willford Bailey, the son Mrs. Bailey brought to Auburn to educate, not only holds a D.V.M. degree (API '42), but also, a doctor of science degree from Johns Hopkins. He began teaching in the School of Veterinary Medicine at Auburn in 1942. He is now head of the Department of Pathology and Parasitology and is a member of the graduate council of the college.

December 1, Dr. Bailey will take a year's leave of absence to do research and to teach at

Mrs. Bessie Bailey and members of her veterinary-minded family. Front row (left to right)—Patricia Watson, Rebecca Nance, Sarah Jane Bailey, Margaret Ann Bailey, and Joe Bailey.
Back row (left to right)—Mrs. Bessie Bailey, Mrs. J. B. Watson, Jr., Joe Watson (on lap); Eddie Bailey, Mrs. Harold Nance, Mike Watson, Dr. Harold Nance, Mrs. W. S. Bailey, and Dr. W. S. Bailey.
Dr. J. B. Watson was not able to attend the family reunion this year due to the demands of his practice.

the University of the Philippines under a science faculty fellowship awarded him by the National Science Foundation.

Mrs. Bailey's youngest daughter is married to Dr. J. B. Watson (API '44). They reside in Trenton, Fla., where Dr. Watson began his practice after graduation.

Each year, members of the family return to Auburn to attend the annual veterinary short-course and to hold a family reunion.

California

State Association.—The seventieth annual convention of the California V.M.A. was held June 23-25, 1958, at the Hotel Sainte Clair in San Jose.

In the course of the three-day convention, approximately 380 people attended the small and large animal sessions and 42 exhibitors displayed the latest products available in the field.

Among the outstanding speakers of the convention were: Drs. Frank Kral, professor of veterinary medicine, University of Pennsylvania; Burnell W. Kingrey, head, Department of Medicine and Surgery, Iowa State College; and Harry Kingman, Jr., assistant executive secretary, AVMA, Chicago.

At the president's banquet held during the convention, the following officers were installed for the ensuing year: Drs. Richard L. Stowe, San Francisco, president; Charles H. Ozanian, Bellflower, president-elect; Edward

Dr. Richard L. Stowe

R. Braun, Handford, first vice-president; Ernest H. Houchin, Ventura, second vice-president; Ralph L. Collinson, Modesto, third vice-president; Russell P. Cope, Berkeley, treasurer; and Mr. Charles S. Travers, executive secretary.

s/KEN HUMPHREYS, *Associate Secretary.*

Colorado

Morris Animal Foundation Meeting.—At the first annual research conference of the Morris Animal Foundation, eight of the country's young research scientists met in Denver on July 7, 1958, to report on the progress made on their research projects to the trustees and the advisory board members of the Foundation.

Dr. Frank Roach, A. & M. College of Texas, and Mr. Richard Hoey, University of Pennsylvania, reported on their findings in the field of dermatosis.

Participating in the research conference of the Morris Animal Foundation in Denver, July 7, were members of the advisory board (left to right)—Dr. Charles W. Bower, Topeka; Dean E. C. Stone, State College of Washington; Dr. George R. Cowgill, Yale University; and Dean William A. Hagan, Cornell University.

A paper on "A Semen Study Under Two Managements" was presented by Dr. George Blackledge of Cornell University and observations entitled "Obesity in the Ovariectomized Bitch" was reviewed by Dr. William B. Dickson of Washington State College.

Drs. Gus Thornton and Newton B. Tennille, both of Oklahoma State University, presented discussions on urography in dogs. Results found in some of the nutrient facets of the animal diet were given by Dr. Donald Will, Colorado State University, and by Sanford Miller of Rutgers University.

Serving on the Foundation's advisory board are Dean W. A. Hagan, New York State Veterinary College, Cornell University; Dean E. C. Stone, College of Veterinary Medicine, State College of Washington; Dr. George R. Cowgill, professor of nutrition, Yale University; and Dr. Charles W. Bower, retired veterinarian, Topeka, Kan.

The foundation is headed by its founder and president, Dr. Mark L. Morris, Topeka, Kan., and Dr. James V. Allison, director of the Biological Research at Rutgers University, is vice-president.

Idaho

New Officers of State Association Named.—The new officers of the Idaho Veterinary Medical Association named at its recent annual meeting are: Drs. J. W. Bailey, Moscow, president; R. M. Thornburg, Burley, vice-president; and Dr. A. P. Schneider, Boise, was re-named secretary.

s/A. P. SCHNEIDER, *Secretary.*

Kentucky

Women's Auxiliary.—The semiannual luncheon and business meeting of the Women's Auxiliary to the Kentucky V.M.A. was held in the Sheraton Room of the Hotel Seelbach, Louisville, on July 21, 1958. Fifty-one women attended, including both members and guests.

The president, Mrs. H. H. Sutton, Lexington, presided at the business meeting at which the following new officers of the auxiliary were elected: Mrs. H. A. Gray, Bowling Green, president; Mrs. Nelson Pott, Glasgow, vice-president; Mrs. Robert H. Folsom, Danville, second vice-president; Mrs. Robert Lee, Lexington, secretary; and Mrs. Otho Lackey, Somerset, treasurer.

Following the luncheon, Mrs. Sarah Daughtery of the "Little Colonel Theatre," Peewee Valley, gave an interesting review of the play, "My Fair Lady." A cocktail hour preceded the dinner-dance in the evening.

s/MRS. ROBERT H. FOLSOM, *Secretary.*

Michigan

First Institute on Veterinary Public Health.—The University of Michigan, School of Public Health, will offer the first Institute on Veterinary Public Health Practice on Oct. 6-9, 1958, at Ann Arbor.

This institute, an interprofessional approach to the utilization of veterinary resources in public health, has a three-fold purpose: (1) to explore, document, and expand the veterinarian's contribution to human health; (2) to collect and evaluate source materials on veterinary public health practices and administration; (3) to compile and publish a proceedings which will reflect the thinking of the institute.

Presiding at the various sessions of the institute will be: Berwyn F. Mattison, M.D., executive secretary, A.P.H.A., New York; William A. Hagan, D.V.M., dean, New York State Veterinary College, Cornell University; R. J. Anderson, M.D., chief, CDC, U.S. P.H.S., Atlanta, Ga.; Herbert H. Hasson, associate director, Division of Medicine and Public Health, W. K. Kellogg Foundation, Battle Creek, Mich.; J. G. Hardenbergh, D.V.M., executive secretary, AVMA, Chicago; Wayne O. Kester, D.V.M., U.S.A.F. (Ret.), executive vice-president, Microbiological Associates, Inc., Washington, D.C.; Seward E. Miller, M.D., director, Institute of Industrial Health, University of Michigan; and Levitte Mendel, M.P.H., director, Public Information and

Health Education Services, Allegheny County Health Department, Pittsburgh, Pa.

Among the subjects to be discussed will be: the public health challenge to veterinary medicine and the evolution of veterinary public health; the working relationships of career veterinarians to public health; the epidemiological approach to human ecology; co-working relationships of veterinary services in agriculture and public health departments; and veterinary services in environmental health.

The enrollment fee of $10 will include the published proceedings for the institute and a certificate of attendance. Applications for enrollment should be addressed to the Continued Education Service, School of Public Health, 109 South Observatory St., Ann Arbor. An advanced application will ensure adequate accommodations.

s/H. E. MILLER, *Director, Continued Education.*

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Detroit Area Sponsors a Veterinary Hospital Open House Week.—On April 20 to 26, 1958, the general public in the Detroit metropolitan area was invited to tour the veterinary hospitals in their community for a behind-the-scenes look. The "open house week" was made possible through the courtesy of the Southeastern Michigan V.M.A., for the purpose of familiarizing the public with the services rendered to the community by the veterinarian and to promote the health and welfare of household pets.

During the week, all association member veterinary hospitals in Wayne, Oakland, and Macomb counties were open to special groups, such as scout troops and service organizations, by appointment. Also during the week, veterinarians were available as speakers for luncheons, dinners, and evening meetings through the speakers bureau.

Hundreds of people availed themselves of the opportunity to get a first-hand picture of the scope of the veterinary scene.

s/RICHARD G. PEARCE, *Public Relations Chairman.*

New Jersey

State Offers Free Diagnostic Service on Canine Lymphoma.—The New Jersey Department of Health and the United States Public Health Service inaugurated a free diagnostic service in connection with a study of the incidence and distribution of canine lymphoma on Jan. 1, 1958.

Over 80 veterinary hospitals throughout the state are presently participating in this study and the state hopes to extend this service to all veterinarians in the area. This study is designed for a minimum period of five years, during which time the confirmed canine lymphoma cases will be registered. This registry will be coordinated with a parallel study of leukemia-lymphoma in man in an effort to find common areas of high incidences and/or animal-to-man relationships. The state feels that in this way, the invaluable clinical experience available in veterinary practice will be utilized in the solution of a vital health problem.

Participating veterinarians will be given two addressed, stamped specimen kits. Each kit will contain a jar with formalin for biopsy or necropsy specimens, two glass slides for peripheral blood smears, and a brief questionnaire identifying the animal involved.

The specimens desired will be portions of affected lymph nodes and, if the animal is dead, portions of liver, spleen, and kidney. Slides will be prepared by Dr. E. Gilbert of the State Department of Health's Pathology Laboratory and read by Dr. John R. McCoy of Rutgers University. Dr. McCoy will then send the definitive diagnosis to the participating veterinarian within seven days from the date the specimens are received in Trenton.

Of the first 31 specimens submitted (as of May 1), 19 were positive for lymphoma. The age span of the animals was 3 to 16 years and the median age was 8.3 years.

s/DANIEL COHEN, *New Jersey State Department of Health.*

North Dakota

Women's Auxiliary.—The annual meeting of the Women's Auxiliary to the North Dakota V.M.A. was held in Williston, June 16, 1958. Forty-three members and guests were present. After the opening luncheon a business meeting was conducted by Mrs. S. S. Bjornson, president.

An interesting and informative report was given by Mrs. D. F. Eveleth on the Women's Auxiliary annual meeting in Cleveland last year. Mrs. D. K. Christian was selected as the delegate to the annual meeting of the AVMA Women's Auxiliary in Philadelphia. The auxiliary again voted to contribute to the Student Loan Fund in the ensuing year.

Plans were also made to cooperate in the news clipping service; *i.e.* all articles pertaining to the veterinary profession in the state will be sent to the North Dakota Auxiliary chairman.

Other activities on the women's program included a reception at Mrs. R. E. Kreiger's home the evening of June 15, and an address on safety in driving by a highway patrol officer following the business meeting June 16. A banquet and dance followed the meeting.

The newly elected officers for the coming year are: Mrs. L. G. Best, Wahpeton, president; Mrs. R. C. Reed, Hillsboro, vice-president; Mrs. D. C. Flagg, Bismarck, secretary; Mrs. J. B. Watkins, Minot, treasurer; and Mrs. D. F. Eveleth, Fargo, membership chairman.

Texas

Above is pictured the presentation of awards to Drs. Dickinson and Brock in recognition of their long outstanding service to the veterinary profession at a testimonial dinner given by the Dallas V.M.A., July 15, 1958 (see JOURNAL, Aug. 15, 1958, page 237). Left to right—Drs. Harold Hall, Irving, president of the Dallas V.M.A.; Dan Anderson, Fort Worth; R. T. Dickinson, Dallas; W. G. Brock, Dallas; and Herman F. Dieterich, Jr., Richardson, vice-president of the Dallas V.M.A.

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Pennsylvania

Local Association Adopts Fee Schedule.—The Bucks-Montgomery Veterinary Medical Association recently adopted an average fee schedule for the guidance of its members. Other interested veterinarians or local associations can obtain a copy on request.

s/M. J. DEUBLER, V.M.D., *Secretary, Box 736, Newtown, Bucks Co., Pa.*

Wisconsin

State Association.—The Wisconsin V.M.A. held a summer clinic at the Marathon County Fair Grounds in Wausau on July 9, 1958. Three hundred and six veterinarians and guests registered for the program.

Dr. B. W. Kingrey of Iowa State College and a group from the University of Minnesota, headed by Dr. Ben Porter, were the out-of-state talent that conducted demonstrations at the clinic. The program consisted of a variation of 25 large and small animal demonstrations.

Among the interesting exhibits given was one presented under the direction of Dr. A. F. Ranney, Washington, D.C., in which

The Veterinary Medical Association of Bexar County presented this exhibit at the Future Farmers of America Convention in San Antonio, Texas, July 16-18, 1958.

The exhibit was dedicated to veterinary education and all the materials distributed stressed veterinary education to the 5,000 young men and women who attended the F.F.A. meeting. Visual materials were supplied by the AVMA, the School of Veterinary Medicine at the A. & M. College of Texas, and the Texas Public Health Department.

The exhibit was designed and constructed entirely by members of the Bexar County V.M.A.

7 bovine animals were sensitized to tuberculin and tested prior to the clinic program. The reactions were typical of animals infected with tuberculosis.

Drs. Chester E. Harries, Medford, and Quentin Metzig, Oshkosh, were co-chairman of the program. Dr. E. S. Scobell of Wausau was chairman of local arrangements.

s/W. J. O'ROURKE, *Correspondent.*

Wyoming

Joint Association Meeting.—The Wyoming V.M.A. met in a combined session with the Idaho V.M.A. at Jackson, Wyo., June 22-23, 1958.

A "veterinarian of the year" plaque for 1958, first such award given by the Wyoming V.M.A., was presented to Dr. L. N. Davidson of Sheridan, who in the early 1900's had been a cowboy for the Brown Land and Cattle Company (Three Circle Ranch) at Birney, Mont.

After graduation from St. Joseph's Veterinary College in 1922, Dr. Davidson began his practice in Clay Center, Neb., before going to Sheridan in 1933. For the past 12 years, he has been with the state veterinarian's office as field man, and since Jan. 1, 1958, he has been assistant state veterinarian.

The officers elected by the Wyoming Association for the coming year are: Drs. John A. Wilson, Sheridan, president; Floyd E. Carroll, Laramie, president-elect; and J. F. Ryff, Laramie, secretary-treasurer.

s/J. F. RYFF, *Secretary.*

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Women's Auxiliary.—The Women's Auxiliary to the Wyoming V.M.A. met in conjunction with the state association, June 22-23, 1958.

The newly elected officers of the auxiliary are: Mrs. E. S. Norton, Lander, president; Mrs. John Simmons, Torrington, vice-president; Mrs. Bert Reinow, Pinedale, second vice-president; Mrs. Brinton Swift, Buffalo, historian; and Mrs. George Glover, Torrington, secretary-treasurer.

s/J. F. RYFF, *Secretary to the Wyoming V.M.A.*

STATE BOARD EXAMINATIONS

Interested persons can obtain information about applications, fees, deadlines for filing applications, and exact time and place of examinations of the respective boards by writing to the persons whose names and addresses are given below.

BRITISH COLUMBIA—November, 1958 (usually end of the second week; Vancouver. G. L. Stovell, British Columbia Veterinary Association, 3187 West 43rd Ave., Vancouver 13, secretary.

DEATHS

Star indicates member of AVMA

Albert A. Biebel (CVC '05), 86, Austin, Texas, died July 11, 1958. An Austin resident for 53 years, Dr. Biebel was born in Belleville, Ill., moving to Austin in 1905. His wife preceded him in death less than seven months ago. He is survived by two nephews.

F. J. Douglass, Sr. (IND '06), 88, New Orleans, La., died at the residence of a daughter, Mrs. J. Garic Schoen, in Beryl, July 8, 1958, after an illness of several months.

A native of Martinville, Ind., he had resided in the New Orleans area since 1911. Before Dr. Douglass retired from active practice several years ago, he was regarded as a specialist in cattle, serving practically every area of Louisiana.

Dr. Douglass was a lifetime member and a past-president of the New Orleans V.M.A. and one-time chairman of the state board of veterinary medical examiners. Surviving him are his widow, two daughters, and three sons, one of whom is also a veterinarian: Dr. F. J. Douglass, Jr. (TEX '44), Metairie, La.

Samuel F. Griesemer (UP '09), 70, Womelsdorf, Pa., a practicing veterinarian for 49 years, died in his home, June 20, 1958.

Dr. Griesemer attended Allentown High School and, after graduation from the University of Pennsylvania, was employed for many years by the Bureau of Animal Industry, U.S.D.A. He was a member of the Bernville American Legion Post and its relief association as well as secretary of Williamson Lodge, 307, A.F. & A.M.

In addition to his widow, Dr. Griesemer is survived by two daughters, three grandchildren, and one brother.

★**Leo C. Holbrook** (TEX '44), 38, San Antonio, Texas, died July 2, 1958, in a local hospital.

Dr. Holbrook was a life-long resident of San Antonio. He was a member of the Bexar County V.M.A. Surviving Dr. Holbrook are his widow, Mrs. Dale Holbrook, two sons, and his mother.

Phillip K. Jones (UP '98), 82, Pittsburgh, Pa., a pioneer veterinarian of the State Department of Agriculture, died June 23, 1958.

Dr. Jones began his career with the state in October, 1907, as one of the first ten veterinarians appointed to serve as meat hygiene inspectors, handling legal investigations for the

State Livestock Sanitary Board, the predecessor of the Bureau of Animal Industry.

In 1915, Dr. Jones entered private practice as a veterinarian and operated a farm near Sarver, in Butler County. He returned to work with the state in 1923 and served until January, 1956.

Henry T. Juen (CHI '13), 70, El Paso, Texas, died of a heart condition June 14, 1958, following an illness of three months.

Dr. Juen, a former Belleville, Ill., veterinarian, moved to El Paso in 1917. He is survived by his widow, Mary Bauer Juen, seven sons, and three daughters.

A. F. McGreevy (GR '15), 72, Sioux City, Iowa, died July 10, 1958. He had retired from the operation of a pet supply shop in Sioux City, in 1957, due to ill health.

Born in Winooski, Vt., Dr. McGreevy attended the public schools and Greenwich Union Academy in New York before graduating from veterinary college. Dr. McGreevy moved to Sioux City in 1925 and opened the first small animal hospital there. In 1944, he moved to Missouri and operated a saddle and horse-breeding farm, later returning to Iowa where he continued to raise horses.

Dr. McGreevy is a former vice-president of the National Veterinary Practitioners Association. He is survived by his widow, Agnes Luck McGreevy; a daughter, and a son.

L. V. Newman (KCV '12), 70, Racine, Wis., died in St. Mary's Hospital after a long illness on June 24, 1958.

Born in Circleville, Ohio, Dr. Newman served in the Veterinary Corps in World War I and moved to Racine in 1925 where he resided for 33 years. Among his affiliations were the American Legion Post 76, Belle City Lodge No. 92, A.F. & A.M., and the Wisconsin V.M.A.

Dr. Newman is survived by his widow, two sons, two daughters, four brothers, and two sisters.

★**Percy E. Phillips** (KCV '15), 65, Winchendon, Mass., died on July 7, 1958, after a long illness.

Born in Bethlehem, N.H., he attended secondary schools in Haverhill and served overseas in France during World War I. Dr. Phillips practiced in Winchendon from 1919 to 1947, when he built a hospital in Gardner and practiced, in partnership with his son, Howard, until 1955.

He had been a member of the Massachusetts V.M.A. for 37 years and also was affiliated with the American Legion and the Kiwanis Club. Dr. Phillips is survived by his widow, Bertha M. Phillips, a daughter, and four sons of whom three are veterinarians: Warren (TEX '44), East Pepperell, Mass.; Howard (MSC '46), Gardner; and Russell (MSC '50), Flint, Mich.; and 13 grandchildren.

George D. Tuttle (CVC '10), 72, Garwin, Iowa, died in his home on June 19, 1958.

Dr. Tuttle is survived by his widow, Ines Lewis Tuttle, a sister, and three brothers.

★**Roy M. Ware** (OSU '47), 47, Sidney, Ohio, president of the board of veterinary examiners of Ohio, died in his home June 9, 1958, of cancer.

Dr. Ware was also a member of the executive committee of the Ohio State V.M.A. In addition to his veterinary duties, he was chairman of the board of Miami River Quarries in Shelby County, and president of the Sidney Kiwanis Club last year.

Dr. Ware belonged to the Antioch Shrine and to the Moose and Elks Lodges. Surviving are his wife, four sons, his father, three brothers, and a sister.

Emery J. Yocom, Sr. (IND '10), 71, Winamac, Ind., died June 19, 1958, in a San Pierre Hospital.

Born in Winamac in 1887, Dr. Yocom was a veteran of World War I. He is survived by two sons, one of whom is also a veterinarian: Dr. Emery J. Yocom, Jr. (MSC '42), Culver City, Ind.; two daughters, eight grandchildren, and a sister.

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Other Deaths Reported.—The following deaths have been reported. The usual information for an obituary was not supplied.

Fred S. Ballard (ISC '11), Ashton, Iowa, died May 26, 1958.

Murray J. Dills (IND '22), 63, Decatur, Ill., died June 15, 1958.

Arthur E. Fabian (CVC '08), Lake Geneva, Wis., died Jan. 31, 1958.

Arthur J. Forsyth (COR '12), 65, Walton, N.Y., died Feb. 22, 1958.

Chester W. Grizzell (KSC '09), 74, Macksville, Kan., died May 12, 1958.

Howard McClure Nedeau (ONT), Miami Beach, Fla., died June 22, 1958.

Howard F. Pegan (ONT '97), Cochranton, Pa., died May 14, 1958.

Edward R. Riley (GWU '11), 84, Nicoma Park, Okla., died July 4, 1958, at his home.

F. Sidney Roop (UP '96), Blacksburg, Va., died March 14, 1958.

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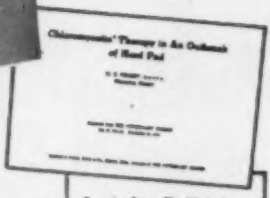

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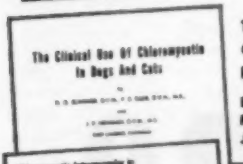

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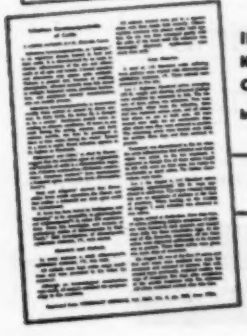
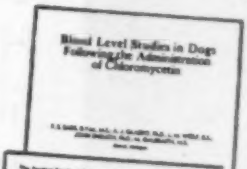
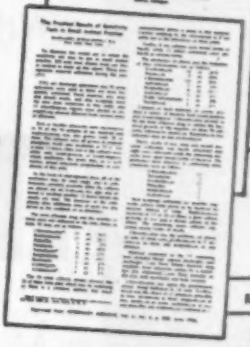


INFECTIOUS KERATOCONJUNCTIVITIS OF CATTLE

by S. Lester Jackson, D.V.M.

Reprint from *Veterinary Medicine*





BLOOD LEVEL STUDIES IN DOGS FOLLOWING THE ADMINISTRATION OF CHLOROMYCETIN

by F. E. Eads, D.V.M., M.S.; A. J. Glazko, Ph.D.; L. M. Wolf, B.S.; John Ehrlich, Ph.D.; M. Galbraith, M.S.

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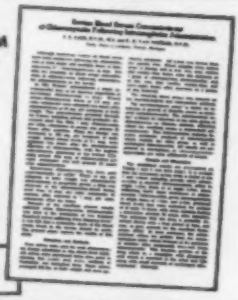
THE PRACTICAL RESULTS OF SENSITIVITY TESTS IN SMALL ANIMAL PRACTICE

by Margaret Schlichting, B.A.

Reprint from *Veterinary Medicine*



BOVINE BLOOD SERUM CONCENTRATIONS OF CHLOROMYCETIN FOLLOWING INTRAMUSCULAR ADMINISTRATION

by F. E. Eads, D.V.M., M.S. and K. D. Van Nocker, D.V.M.

Reprint from *The California Veterinarian*

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STUDENT CHAPTER ACTIVITIES

University of Illinois Student Chapter.—Altogether, the Student Chapter of the University of Illinois held seven meetings during the past semester. At the first meeting, Feb. 6, 1958, Dr. W. W. Armistead, dean, College of Veterinary Medicine, Michigan State University, and president of the AVMA, spoke on public relations and veterinary medicine.

Later in the month, on February 20, Dr. Gale Taylor, a general practitioner from Oakland, Ill., advised the Student Chapter on beginning a practice.

Harold W. Hannah, associate dean, College of Agriculture, University of Illinois, reviewed the agricultural conditions in India on March 6, and on March 20, Dr. G. R. Burch, director of the Pitman-Moore research farm, Zionsville, Ind., discussed the various types of veterinary practices.

On April 8, Dr. R. W. Worley, a small animal practitioner from South Bend, Ind., helped enlighten the chapter on the various business aspects of veterinary medicine.

The speaker at the April 17th meeting of the chapter, Lt. Col. Wayne D. Shipley, Veterinary Corps, Quartermaster Depot, U.S. Army, Chicago, supplemented his discussion on the veterinary opportunities pertaining to the military, with a movie on the job of the veterinarian in the service.

Dr. R. K. Shideler, large animal practitioner from Danville, Ill., presented slides of his practice in conjunction with his talk on good practice habits, at the meeting held on May 1.

The annual spring banquet for the seniors of the Student Chapter was held on May 17, with Mr. Charles Schuman, president of the Farm Bureau, as speaker for the event.

The officers elected for the coming fall semester are as follows: Dr. Alvin H. Safanie, faculty advisor; Melvin Dewey, president-elect; Marion Bliler, vice-president; Albert Lewis, treasurer; and Earl Montgomery, secretary.

s/ROBERT M. MACK, *Retiring-Secretary.*

APPLICATIONS

Graduate Applicants

The following are graduates who have recently received their veterinary degree and who have applied for AVMA membership under the provision granted in the Administrative Bylaws to members in good standing of student chapters.

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COMING MEETINGS

Georgia Coastal Plain Experiment Station, Fourteenth annual conference for veterinarians. Animal Disease Department, Route 2, Tifton, Ga., Sept. 22-23, 1958. Maurice W. Hale, chairman.

New England Veterinary Medical Association. Annual meeting. Hotel Wentworth-By-The-Sea, Portsmouth, N. H., Sept. 28-Oct. 1, 1958. C. Lawrence Blakely, 180 Longwood Ave., Boston 15, Mass., secretary-treasurer.

Missouri, University of, Annual short course for graduate veterinarians. School of Veterinary Medicine, Columbia, Mo., Oct. 6-7, 1958. Cecil Elder, chairman.

First institute on veterinary public health practice. Annual meeting. School of Public Health, University of Michigan, Ann Arbor, Oct. 6-9, 1958. H. E. Miller, director, continued education.

Iowa State College. Tenth annual veterinary homecoming luncheon. Veterinary courtyard, Oct. 11, 1958, at 11:00 a.m. Robert H. Keith, 621 Pammel Court, Ames, Iowa, publicity chairman.

Florida State Veterinary Medical Association. Annual meeting. Galt Ocean Mile Hotel, Fort Lauderdale, Oct. 12-14, 1958. A. R. Chambers, 6116 Main St., Jacksonville, secretary.

District of Columbia Veterinary Medical Association. Annual all-day meeting. Walter Reed Army Medical Center, Washington, D.C., Oct. 14, 1958. W. I. Gay, 5200 Chandler St., Bethesda, Md., secretary-treasurer.

Eastern Iowa Veterinary Association, Inc. Annual meeting. Hotel Roosevelt, Cedar Rapids, Oct. 16-17, 1958. F. E. Brutsman, Traer, Iowa, secretary-treasurer.

Texas Veterinary Medical Association. Annual meeting. Stephen F. Austin Hotel, Austin, Oct. 19-21, 1958. Paul B. Blunt, 710 Maverick Bldg., San Antonio, secretary.

Illinois, University of. Annual Illinois veterinary conference and extension short course for veterinarians. College of Veterinary Medicine, Urbana, Oct. 23-24, 1958. L. E. Boley, 311 W. William St., Champaign, Ill., chairman.

Southern Veterinary Medical Association. Annual meeting. Claridge Hotel, Memphis, Tenn., Oct. 26-30, 1958. A. A. Husman, P.O. Box 91, Raleigh, N. Car., secretary.

American Public Health Association. Annual meeting. St. Louis, Mo., Oct. 27-31, 1958. Berywn F. Mattison, M.D., executive secretary, 1790 Broadway, New York 19, N.Y.

United States Livestock Sanitary Association. Sixty-second annual meeting. Hotel Deauville, Miami Beach, Fla., Nov. 4-7, 1958. R. A. Hendershott, secretary-treasurer.

Mississippi Valley Veterinary Medical Association. Annual meeting. Père Marquette Hotel, Peoria, Ill., Nov. 5-6, 1958. W. P. Hendren, Carthage, Ill., secretary-treasurer.

Arizona Veterinary Medical Association. Annual meeting. Yuma Country Club, Yuma, Dec. 7-9, 1958. Robert E. McComb, Jr., Phoenix, program chairman; Thomas E. Lightle, Route 1, Box 817, Yuma, in charge of reservations.

Southern California Veterinary Medical Association. Annual meeting. Beverly Hilton Hotel, Beverly Hills, Jan. 10, 1959. R. J. Schroeder, 1919 Wilshire Blvd., Los Angeles, Calif., program chairman.

Tennessee Veterinary Medical Association. Annual meeting.

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Noel Hotel, Nashville, Jan. 11-13, 1959. H. W. Hayes, 5009 Clinton Pike, Knoxville, secretary-treasurer.

Oklahoma Veterinary Medical Association. Annual meeting. Mayo Hotel, Tulsa, Jan. 25-27, 1959. M. N. Riemenschneider, 122 State Capitol Bldg., Oklahoma City, secretary.

Ohio State Veterinary Medical Association. Annual convention. Neil House Hotel, Columbus, Feb. 4-6, 1959. Harry C. Sharp, 1411 W. Third Ave., Columbus, Ohio, executive secretary.

Foreign Meetings

German Veterinary Association. Regular biennial meeting. Hannover, Germany, Sept. 19-21, 1958. Dr. Karl Ohly, 123 Forsthausstrasse, Frankfurt/Main, Germany, president.

Seventh International Congress on Hydatid Disease, Beirut, Lebanon, Sept. 20-22, 1958. Dr. Elias Sader, c/o Lebanese Order of Physicians, P.O.B. 640, Beirut, Lebanon, secretary-general. (Applications to present papers must be accompanied by an abstract).

International Veterinary Congress. Sixteenth session. Madrid, Spain, May 21-27, 1959. Prof. Pedro Cards A., general secretary, Calle Villanueva 11, Madrid.

U.S. COMMITTEE: Dr. W. A. Hagan, chairman, New York State Veterinary College, Ithaca, N. Y.; Dr. J. G. Hardenbergh, secretary, 600 S. Michigan Ave., Chicago 5, Ill.

Third World Congress on Fertility and Sterility Amsterdam, Holland, June 7-13, 1959. Dr. L. I. Swaab, Sint Agnietenstraat 4, Amsterdam, Holland, honorary secretary.

Regularly Scheduled Meetings

ALABAMA—Central Alabama Veterinary Association, the first Thursday of each month. Dr. G. W. Jones, Main St., Prattville, Ala., secretary-treasurer.

Jefferson County Veterinary Medical Association, the second Thursday of each month. S. A. Price, 213 N. 15th St., Birmingham, secretary.

Mobile-Baldwin Veterinary Medical Association, the third Tuesday of each month. W. David Gross, 771 Holcombe Ave., Mobile, Ala., secretary.

North Alabama Veterinary Medical Association, the second Thursday of November, January, March, May, July, and September, in Decatur, Ala. Ray A. Ashwander, Decatur, Ala., secretary.

North East Alabama Veterinary Medical Association, the second Tuesday of every other month. Leonard J. Hill, P.O. Box 761, Gadsden, Ala., secretary-treasurer.

ARIZONA—Central Arizona Veterinary Medical Association, the second Tuesday of each month. Keith T. Maddy, Phoenix, Ariz., secretary.

Southern Arizona Veterinary Medical Association, the third Wednesday of each month at 7:30 p.m. E. T. Anderson, Rt. 2 Box 697, Tucson, Ariz., secretary.

CALIFORNIA—Alameda-Contra Costa Veterinary Medical Association, the fourth Wednesday of Jan., March, May, June, Aug., Oct., and Nov. Leo Goldston, 3793 Broadway, Oakland 11, Calif., secretary.

Bay Counties Veterinary Medical Association, the second Tuesday of February, April, July, September, and December. Herb Warren, 3004 16 St., San Francisco, Calif., executive secretary.

Central California Veterinary Medical Association, the fourth Tuesday of each month. R. B. Barsaleau, 2333 E. Mineral King, Visalia, Calif., secretary.

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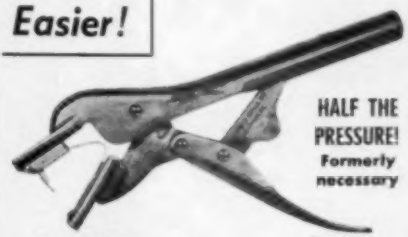

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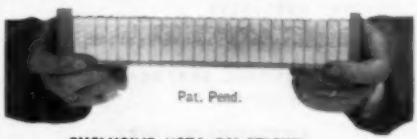

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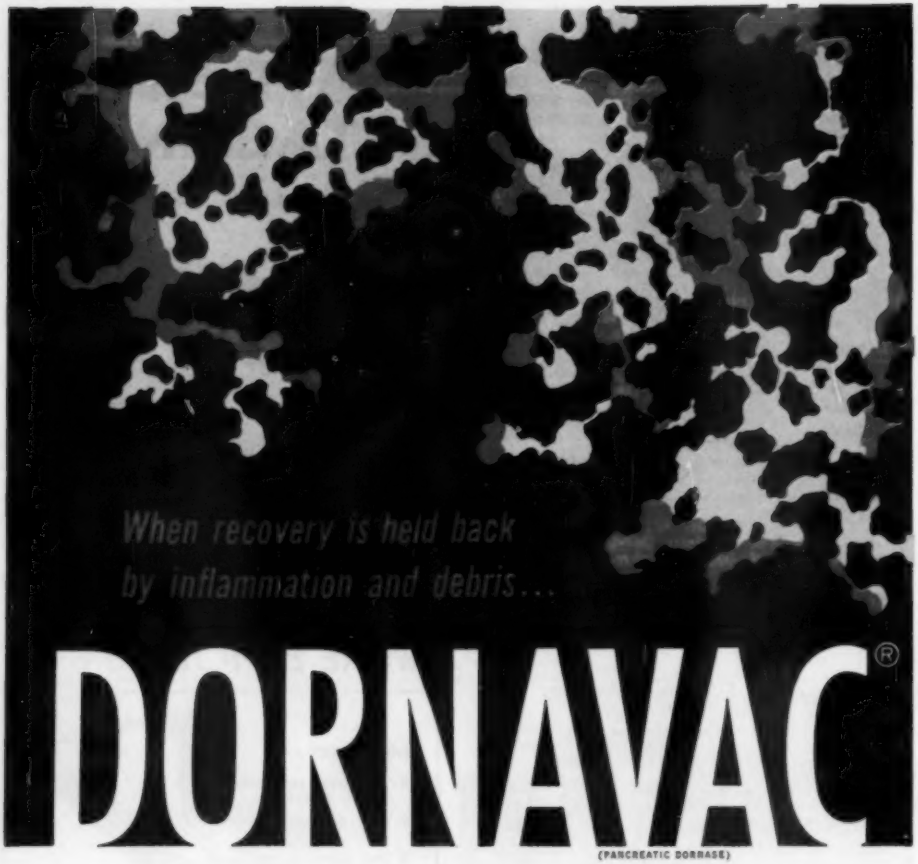

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Thursday evening of each month. James L. Frederickson, 17 Niles St., Bakersfield, Calif., secretary-treasurer.

Mid-Coast Veterinary Medical Association, the first Thursday of every even month. W. H. Rockey, P. O. Box 121, San Luis Obispo, Calif., secretary.

Monterey Bay Area Veterinary Medical Association, the third Wednesday of each month. Lewis J. Campbell, 90 Corral de Tierra, Salinas, Calif., secretary.

North San Joaquin Valley Veterinary Medical Association, the fourth Wednesday of each month at the Hotel Covell, in Modesto, Calif. Lyle A. Baker, Turlock, Calif., secretary.

Orange Belt Veterinary Medical Association, the second Monday of each month. Chester A. Maeda, 766 E. Highland Ave., San Bernardino, Calif., secretary.

Orange County Veterinary Medical Association, the third Thursday of each month. Donald E. Lind, 2643-N. Main St., Santa Ana, Calif., secretary.

Peninsula Veterinary Medical Association, the third Monday of each month. R. M. Granfield, 2600 W. El Camino Real, San Mateo, Calif., secretary-treasurer.

Redwood Empire Veterinary Medical Association, the third Thursday of each month. Robert L. Chandler, P.O. Box 8, Ukiah, Calif., secretary.

Sacramento Valley Veterinary Medical Association, the second Wednesday of each month. W. E. Steinmetz, 4227 Freeport Blvd., Sacramento, Calif., secretary.

San Diego County Veterinary Medical Association, the fourth Tuesday of each month. H. R. Rossoll, 1795 Moore St., San Diego, Calif., secretary.

San Fernando Valley Chapter SCVMA, the second Tuesday of each month at 7:30 p.m., Hody's Restaurant, North Hollywood, Calif. Dr. V. H. Austin, 14931 Oxnard St., Van Nuys, secretary-treasurer.

San Fernando Valley Veterinary Medical Association, the second Friday of each month at the Casa Escobar Restaurant in Studio City. Dr. Rolf Reese, 25815 Ventura Blvd., Calabasas, Calif., secretary.

Santa Clara Valley Veterinary Association, the fourth Tuesday of each month. Kay Beulley, N. Fourth and Gish Rd., San Jose, Calif., secretary.

Southern California Veterinary Medical Association, the last Wednesday of each month. Don Mahan, 1919 Wilshire Blvd., Los Angeles 57, Calif., executive secretary.

Tulare County Veterinary Medical Association, the second Thursday of each month. D. E. Britten, 544 N. Ben Maddox, Visalia, Calif., secretary.

COLORADO—Denver Area Veterinary Society, the fourth Tuesday of every month. Richard C. Tolley, 5060 S. Broadway St., Englewood, Colo., secretary.

Northern Colorado Veterinary Medical Society, the first Monday of each month. M. A. Hammarlund, School of Veterinary Medicine, Colorado A. & M. College, Fort Collins, Colo., secretary.

DELAWARE—New Castle County Veterinary Association, the first Tuesday of each month at 9:00 p.m. in the Hotel Rodney, Wilmington, Del. E. J. Hathaway, Clifton Park Manor, Apt. 73-5, Wilmington 2, Del., secretary.

FLORIDA—Central Florida Veterinary Medical Association, the first Tuesday of each month, time and place specified monthly. Jack H. McElyer, 5925 Edgewater Drive, Orlando, Fla., secretary.

Florida West Coast Veterinary Medical Association, the second Wednesday of each month at the Lighthouse Inn, St. Petersburg. William F. Casler, 2540 30th Ave., N., St. Petersburg, secretary-treasurer.

Jacksonville Veterinary Medical Association, the first Thursday of every month. Dodsons Restaurant, P. S. Roy, 4443 Atlantic Blvd., Jacksonville, Fla., secretary.

Northwest Florida Veterinary Medical Society, third Wednesday of each month, time and place specified monthly. T. R. Geci, 108B Catherine Ave., Pensacola, Fla., secretary.

Palm Beach Veterinary Society, the last Thursday of each month in the county office building at 810 Datura St., West Palm Beach. J. J. McCarthy, 500-25th Street, West Palm Beach, Fla., secretary.

Ridge Veterinary Medical Association, the fourth Thursday of each month in Bartow, Fla. Paul J. Myers, Winter Haven, Fla., secretary.

South Florida Veterinary Society, the third Wednesday of each month. Time and place specified monthly. Frank Mueller, Jr., 4148 E. 8th Ave., Hialeah, Fla., secretary.

Suwannee Valley Veterinary Association, the fourth Tuesday of each month, Hotel Thomas, Gainesville. W. B. Martin, Jr., 3002 N. W. 6th St., Gainesville, Fla., secretary.

Volusia County Veterinary Medical Association, the fourth Thursday of each month. A. E. Hixon, 131 Mary St., Daytona Beach, Fla., secretary.

GEORGIA—Atlanta Veterinary Society, the third Thursday of each month at the Elk's Home, 726 Peachtree St., Atlanta. Donald C. Ford, Forest Park, secretary.

ILLINOIS—Chicago Veterinary Medical Association, the second Tuesday of each month. Charles H. Armstrong, 1021 Davis St., Evanston, secretary.

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(Continued on adv. p. 40)

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References: 1. Kakavas, J. C.; Roberts, H. D. B.; de Courcy, S. J. and Ewing, D. L.: J. Am. Vet. M. Ass. 119:203 (Sept.) 1951. 2. Kakavas, J. C.: Antibiotics Annual 1954-1955, New York, Medical Encyclopedia, Inc., 1955, p. 323. 3. Mires, M. H. and Chadwick, R. H.: Vet. News 10:3 (Jan.-Feb.) 1947. 4. Mires, M. H.: J. Am. Vet. M. Ass. 117:49 (July) 1950. 5. Mires, M. H.: Vet. News 14:9 (May-June) 1951. 6. Roberts, H. D. B.; Kakavas, J. C. and Biddle, E. S.: N. Amer. Vet. 34:247 (April) 1953.

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What Is Your Diagnosis?

Because of the interest in veterinary radiology, a case history and radiographs depicting a diagnostic problem are usually published in each issue.

Make your diagnosis from these pictures—then turn the page

History.—A nonspayed female Irish Setter, 7 years old, had rapid and deep abdominal breathing for a month. There was no history of illness or injury, and the appetite and temperature were normal. The thorax was barrel-shaped, and the dog stood with her head extended and the elbows turned outward. Three radiographs were taken: lateral standing (fig. 3), lateral recumbent (fig. 2), and erect ventrodorsal (fig. 1) views.

Fig. 1—Radiograph, erect ventral view.

Fig. 2—Radiograph, lateral recumbent view.

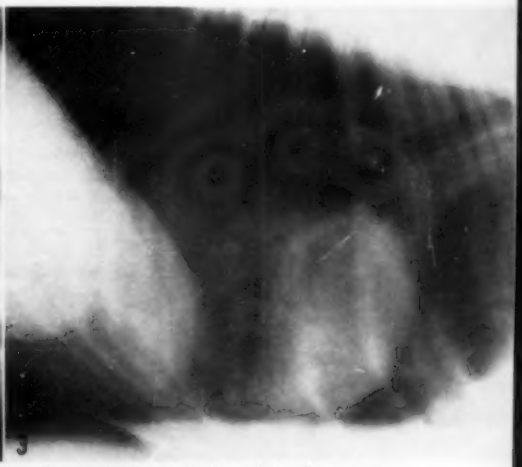


Fig. 3—Radiograph, lateral standing view.

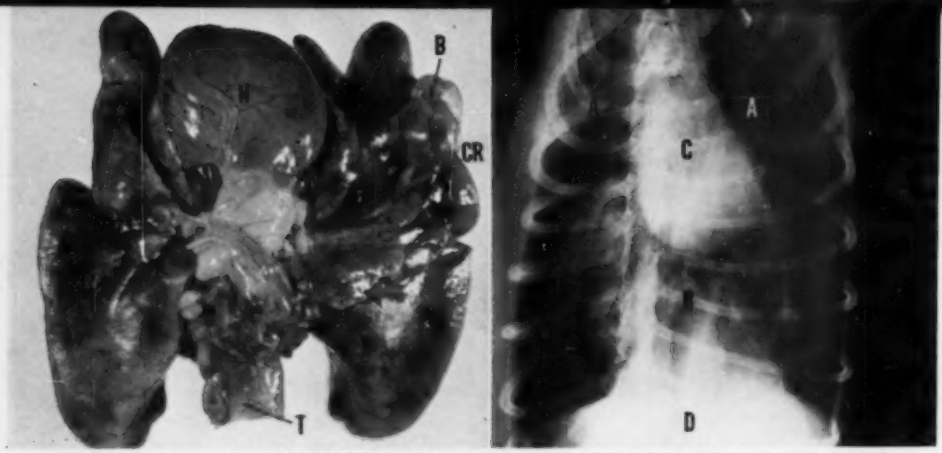


Fig. 4—The lungs and heart (left). The lungs, except the cardiac lobe of the right lung, are in normal position as viewed dorsally with the apical lobes shown at the top.
The heart and trachea were vertically rotated one-half turn; the heart (H) being moved ventrally and cephalad, and the trachea (T) being moved dorsally and caudad. This rotation turned the right cardiac lobe of the right lung (CR) outward bringing into view the bullae (B) on its medial surface.

Fig. 5—Radiograph, erect ventrodorsal view (right), showing pneumothorax. (A).
All lobes of the lungs show atelectasis (B), and are shown suspended caudad to the heart (C). The intrathoracic pressure has caused the dome of the diaphragm (D) to be lowered when the dog is in this erect position.

Here Is the Diagnosis

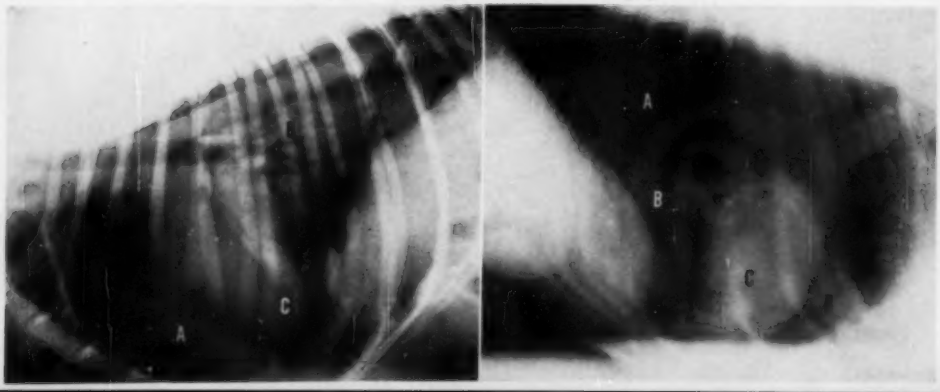
Diagnosis.—Pneumothorax. At necropsy the condition was found to be the result of a rupture of one of several bullae which projected from the medial surface of the apex of the cardiac lobe of the right lung (fig. 4). All the lobes were atelectatic, especially the lobe in which the bullae were present.

Comment.—Emphysema is not unusual in the dog, but the presence of pulmonary bullae associated with the condition is rare. The bullae usually form in the more poorly supported regions (apex, anterior margin, base of the lobe). The formation of bullae occurs where rupture and destruction of the elastic tissue of the alveolus allows air to enter the interstitial tissue and accumulate under the pleura. Intralobular pressure is then communicated to the bullae causing the pleura to stretch and ultimately rupture, allowing the escape of air into the pleural cavity. In this dog, if the nature and extent of the lesions had been known, the condition could have been corrected by lobectomy, since the bullae were confined to one lobe.

This case was submitted by Dr. G. S. Elwood, Chicago, Ill.

Fig. 6—Radiograph, lateral recumbent view (left), showing pneumothorax (A), with apex of the heart (C), the mediastinum, trachea, and aorta elevated to the vertebral column. The atelectatic lungs (B) are deflected caudad to a position between the heart and the diaphragm.

Fig. 7—Radiograph, lateral standing view (right), showing pneumothorax (A) which comes to the top of the pleural cavity forcing all viscera downward with the atelectatic lobes of the lungs (B) visible anterior and posterior to the heart (C).



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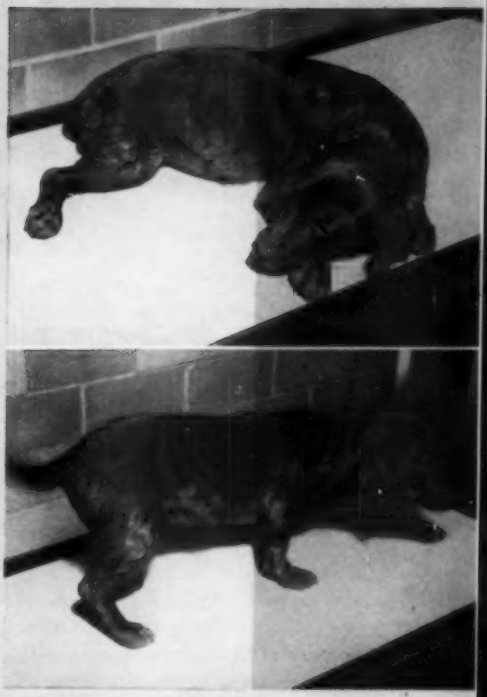

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[1]J.A.M.A., 155, 17, Aug. 21, 1954
[2]Burns, J.J., Schulert, A., Chenkin, T., Goldman, A., and Brodie, B.B.: J. Pharmacol. & Exper. Therap., 100, 530, 1952
[3]Lieberman, L.L.: J. Am. Vet. M.A., 125, 128, 1954
[4]Joshua: Vet. Rec., Jan. 21, 1956
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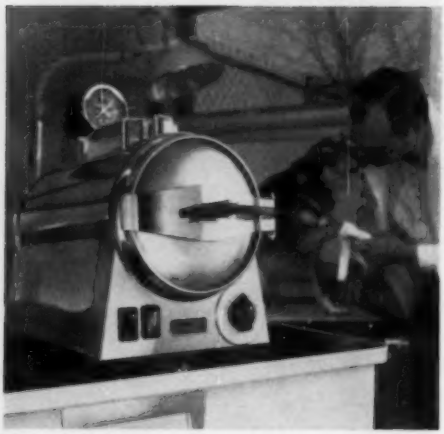

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INDIANA—Central Indiana Veterinary Medical Association, the second Wednesday of each month. Peter Johnson, Jr., 4410 N. Keystone Ave., Indianapolis 5, secretary.

Michiana Veterinary Medical Association, the second Thursday of every month except July and December, at the Hotel LaSalle, South Bend, Ind. J. M. Carter, 3421 S. Main St., Elkhart, Ind., secretary.

Tenth District Veterinary Medical Association, the third Thursday of each month. J. S. Baker, P.O. Box 52, Pendleton, Ind., secretary.

IOWA—Cedar Valley Veterinary Medical Association, the second Monday of each month, except January, July, August, and October in Black's Tea Room, Waterloo, Iowa. A. J. Cotton, Grundy Center, secretary.

Central Iowa Veterinary Medical Association, the third Monday of each month, except June, July, and August, at 6:30 p.m., Breeze House, Ankeny, Iowa. John Herrick, Ames, secretary.

Coon Valley Veterinary Medical Association, the second Wednesday of each month, September through May, at 7:30 p.m., Cobblestone Inn, Storm Lake, Iowa. Robert McCutcheon, Holstein, secretary.

East Central Iowa Association, the second Thursday of each month at 6:30 p.m., usually in Cedar Rapids, Iowa. Dr. J. G. Irwin, Iowa City, secretary.

Fayette County Veterinary Medical Association, the third Thursday of each month at 6:30 p.m. in West Union, Iowa. H. J. Morgan, West Union, secretary.

Lakes Veterinary Association, the first Tuesday of each month, September through May, at 6:30 p.m., at the Gardson Hotel, Estherville, Iowa. Barry Barnes, Milford, secretary.

North Central Iowa Veterinary Medical Association, the third Thursday of April, at the Warden Hotel, Fort Dodge, Iowa. H. Engelbrecht, P. O. Box 797, Fort Dodge, secretary.

Northeast Iowa-Southern Minnesota Veterinary Association, the first Tuesday of February, May, August, and November at the Wiseslick Hotel, Decorah, Iowa, 6:30 p.m. Donald E. Moore, Box 178, Decorah, Iowa, secretary.

Northwest Iowa Veterinary Medical Association, the second Tuesday of February, May, September, and December, at the Community Bldg., Sheldon. W. Ver Meer, Hull, secretary.

Southeastern Iowa Veterinary Association, the first Tuesday of each month at Mt. Pleasant, Iowa. Warren Kilpatrick, Mediapolis, secretary.

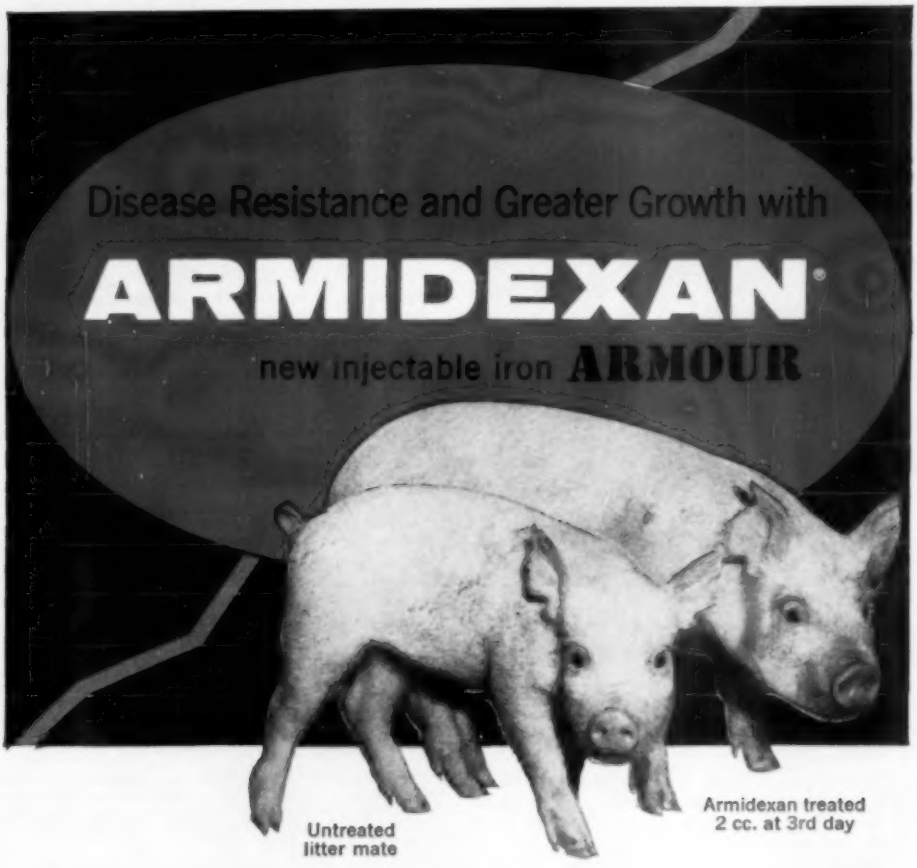
Southwestern Iowa Veterinary Medical Association, the first Tuesday of April and October. Hotel Chieftain, Council Bluffs, Iowa. J. P. Stream, Creston, secretary.

Upper Iowa Veterinary Medical Association, the third Tuesday of each month at 7:00 p.m., at All Vets Center, Clear Lake, Iowa. Richard Baum, Osage, secretary.

KENTUCKY—Central Kentucky Veterinary Medical Association, the first Wednesday of each month. R. H. Folsom, P.O. Box 323, Danville, Ky., secretary.

Jefferson County Veterinary Society of Kentucky, Inc., the first Wednesday of each month in Louisville or within a radius of 50 miles, except January, May, and July. G. R. Comfort, 2102 Reynolds Lane, Louisville, Ky., secretary-treasurer.

MARYLAND—Baltimore City Veterinary Medical Association, the second Thursday of each month, September through May (except December), at 9:00 p.m., at the Park Plaza Hotel, Charles and Madison St., Baltimore, Md. Norman Herbert, 3506 Joann Drive, Baltimore 7, Md., secretary.



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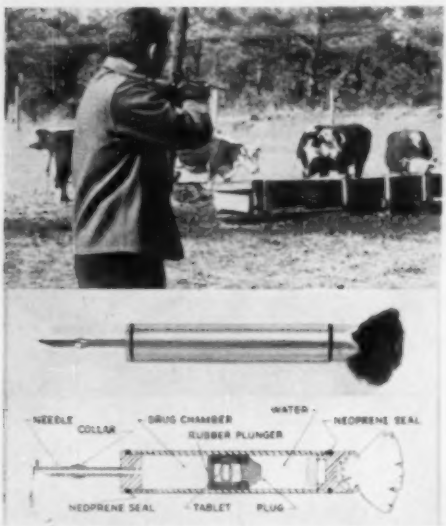
Flying Syringe

When cattle, dogs, and other domestic animals stray from home, they can be quickly tamed by a long-distance tranquillizer, according to Palmer Chemical & Equipment Company, Inc., Atlanta, Ga., the manufacturer.



The flying syringe in operation and in diagram.

The device is a flying syringe which, when fired from a special gun, injects nicotine into the body of the animal as soon as it strikes home. This stuns the animal for up to 30 minutes without harmful after-effects, according to the company. Valuable to game wardens and to hunters of zoological specimens, it can also be used to halt riots.

The propulsive force for injecting the nicotine is carbon dioxide gas, formed when a tablet dissolves in water as the gun is fired. The syringes vary in length from 2 to 6 inches, depending on the size of the animal. The needle, which is painless to animals, is made from 13-gauge needle tubing supplied by the Superior Tube Company, Norristown, Pa.

MICHIGAN—Central Michigan Veterinary Medical Association, the first Wednesday of every month at 7 p.m. Frank A. Carter, P.O. Box 78, Carson City, Mich., secretary.

Mid-State Veterinary Medical Association, the fourth Thursday of each month with the exception of November and December. Robert E. Kader, 5034 Armstrong Rd., Lansing 17, Mich., secretary.

Saginaw Valley Veterinary Medical Association, the last Wednesday of each month. S. Correll, Rt. 1, Midland, Mich., secretary.

Southeastern Veterinary Medical Association, the fourth Wednesday of every month, September through May. Gilbert Meyer, 14003 E. Seven Mile Rd., Detroit 9, Mich., secretary.

MISSOURI—Greater St. Louis Veterinary Medical Association, the first Friday of each month (except July and August), at the Coronado Hotel, Lindell Blvd. and Spring Ave., St. Louis, Mo., at 8 p.m. Edwin E. Epstein, 4877 Natural Bridge Ave., St. Louis 15, Mo., secretary.

Kansas City Veterinary Medical Association and Kansas City Small Animal Hospital Association, the third Thursday of each month at the Hotel President, Kansas City, Mo. Frank A. O'Donnell, Parksville, Mo., secretary-treasurer.

NEVADA—Western Nevada Veterinary Society, the first Tuesday of each month. Paul S. Silva, 1170 Airport Road, Reno, Nev., secretary.

NEW JERSEY—Central New Jersey Veterinary Medical Association, the second Thursday of November, January, March, and May at Old Hights Inn, Hightstown, N. J. David C. Tudor, Cranbury, N. J., secretary.

Metropolitan New Jersey Veterinary Medical Association, the third Wednesday evening of each month from October through April at the Irvington House, 925 Springfield Ave., Irvington, N.J. Bernard M. Weiner, 787 Clinton Ave., Newark, N.J., secretary.

Northern New Jersey Veterinary Association, the fourth Tuesday of each month at the Elks Club, Hackensack. Burritt Lupton, 569 Franklin Ave., Wyckoff, secretary.

Northwest Jersey Veterinary Society, the third Wednesday of every odd month. G. R. Muller, 43 Church St., Lambertville, N. J., secretary.

Southern New Jersey Veterinary Medical Association, the fourth Tuesday of each month at the Collingswood Veterinary Hospital, Collingswood. R. M. Sauer, secretary.

NEW MEXICO—Bernalillo County Veterinary Practitioners Association, third Wednesday of each month, Fez Club, Albuquerque, N.M. Jack Ambrose, 3018 N. Rio Grande Blvd., Albuquerque, secretary-treasurer.

NEW YORK—New York City, Inc., Veterinary Medical Association of, the first Wednesday of each month at the New York Academy of Sciences, 2 East 63rd St., New York City. C. E. DeCamp, 43 West 61st St., New York 23, N. Y., secretary.

New York State Veterinary College, Annual conference for veterinarians. Cornell University, Ithaca. W. A. Hagan, New York State Veterinary College, Cornell University, Ithaca, N. Y., dean.

Monroe County Veterinary Medical Association, the first Thursday of even-numbered months except August. Irwin Bircher, 50 University Ave., Rochester, N. Y., secretary.

NORTH CAROLINA—Central Carolina Veterinary Medical Association, the second Wednesday of each month at 7:00 p.m. in the O'Henry Hotel, Greensboro. Joseph A. Lombardo, 411 Woodlawn Ave., Greensboro, secretary.

Eastern North Carolina Veterinary Medical Association, the first Friday of each month, time and place specified monthly, Byron H. Brow, Box 453, Goldsboro, N. Car., secretary.

Piedmont Veterinary Medical Association, the last Friday of each month. T. L. James, Box 243, Newton, N. Car., secretary.

Twin Carolinas Veterinary Medical Association, the third Friday of each month at Orange Bowl Restaurant, Rockingham, N. Car., at 7:30 p.m. J. E. Currie, 690 N. Leak St., Southern Pines, N. Car., secretary.

Western North Carolina Veterinary Medical Association, the second Thursday of every month at 7:00 p.m. in the George Vanderbilt Hotel, Asheville, N. Car. Vilu Lind, 346 State St., Marion, N. Car., secretary.

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REFERENCES: 1. Bull, W. S.: N. Amer. Vet., in press. 2. Henry, R. T., and Blackburn, E. G.: Vet. Med., in press.

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Veterinary Division

Bristol, Tennessee

Dr. Carl Schulz Joins Staff of Quaker Oats Company

Dr. Carl W. Schulz (KSC '34), formerly head of the Department of Veterinary Medicine and Surgery at A. & M. College of Texas, has joined The Quaker Oats Company as manager of veterinary services, with headquarters in Barrington, Ill.

Dr. Carl W. Schulz

Dr. Schulz joined the staff of the A. & M. College of Texas as director of clinics for the School of Veterinary Medicine in 1956, and a year later was made head of the Department of Veterinary Medicine and Surgery.

Prior to joining the staff of A. & M. College of Texas, Dr. Schulz had been engaged in general veterinary practice in Jefferson City, Mo., for 18 years.

OHIO—Cincinnati Veterinary Medical Association, the third Tuesday of every month at Shuller's Wigwam, 6210 Hamilton Ave., at North Bend Road, G. C. Lewis, Cincinnati, Ohio, secretary-treasurer,

Columbus Academy of Veterinary Medicine, every month, September through May. E. M. Simonson, Columbus, Ohio, secretary-treasurer.

Cuyahoga County Veterinary Medical Association, the first Wednesday in September, October, December, February, March, April and May, at 9:00 p.m. at the Carter Hotel, Cleveland, Ohio. F. A. Coy, Cleveland, Ohio, secretary.

Dayton Veterinary Medical Association, the third Tuesday of every month. O. W. Fallang, Dayton, secretary.

Killbuck Valley Veterinary Medical Association, the first Wednesday of alternate months beginning with February. D. J. Kern, Killbuck, Ohio, secretary-treasurer.

Mahoning County Veterinary Medical Association, the third Tuesday of each month, at 9:00 p.m., Youngstown Maennerchor Club, Youngstown, Ohio. Sam Segall, 2935 Glenwood Ave., Youngstown, secretary.

Miami Valley Veterinary Medical Association, the first Wednesday of December, March, June, and September. J. M. Westfall, Greenville, Ohio, secretary-treasurer.

North Central Ohio Veterinary Medical Association, the last Wednesday of each month except during the summer. R. W. McClung, Tiffin, Ohio, secretary-treasurer.

Northwestern Ohio Veterinary Medical Association, the last Wednesday of March and July. C. S. Alvanos, Toledo, Ohio, secretary-treasurer.

Stark County Veterinary Medical Association, the second Tuesday of every month, at McBrides Emerald Lounge, Canton, Ohio. M. L. Willen, 4423 Tuscarawas St., Canton, Ohio, secretary.

Summit County Veterinary Medical Association, the last Tuesday of every month (except June, July, and August), at the Mayflower Hotel, Akron, Ohio. M. L. Scott, Akron, Ohio, secretary-treasurer.

Tri-County Veterinary Medical Association, the fourth Wednesday of January, May, and September. Mrs. R. Slusher, Mason, Ohio, secretary-treasurer.

OKLAHOMA—Oklahoma County Veterinary Medical Association, the second Wednesday of every month, 7:30 p.m., Patrick's Foods Cafe, 1016 N.W. 23rd St., Oklahoma City. Forest H. Stockton, 2716 S.W. 29th St., Oklahoma City, Okla., secretary.

Tulsa Veterinary Medical Association, the third Thursday of each month in Directors' Parlor of the Brookside State Bank, Tulsa, Okla. Don L. Hohmann, 538 S. Madison St., Tulsa, Okla, secretary.

OREGON—Portland Veterinary Medical Association, the second Tuesday of each month, at 7:30 p.m., Ireland's Restaurant, Lloyds', 718 N.E. 12th Ave., Portland. Donald L. Moyer, 8415 S.E. McLoughlin Blvd., Portland 2, Ore., secretary.

Willamette Veterinary Medical Association, the third Tuesday of each month, except July and August, at the Marion Hotel, Salem. Marvin M. Corff, McMinnville, Ore., secretary.

PENNSYLVANIA—Keystone Veterinary Medical Association, the fourth Wednesday of each month at the University of Pennsylvania School of Veterinary Medicine. Raymond C. Snyder, N.E. Corner 47th St. and Hazel Ave., Philadelphia 43, Pa., secretary.

Lehigh Valley Veterinary Medical Association, the first Thursday of each month. Stewart Rockwell, 10th and Chestnut Sts., Emmaus, Pa., secretary.

Pennsylvania Northern Tier Veterinary Medical Association, the third Wednesday of each odd numbered month. R. L. Michel, Troy, Pa., secretary.

SOUTH CAROLINA—Piedmont Veterinary Medical Association, the third Wednesday of each month at the Fairforest Hotel, Union, S. Car. Worth Lanier, York, S. Car., secretary.

TEXAS—Coastal Bend Veterinary Association, the second Wednesday of each month. J. Marvin Prewitt, 4141 Lexington Blvd., Corpus Christi, Texas, secretary.

VIRGINIA—Central Virginia Veterinarians' Association, the third Thursday of each month at the William Byrd Hotel in Richmond at 8:00 p.m. M. R. Levy, 312 W. Cary Cr., Richmond 20, Va., secretary.

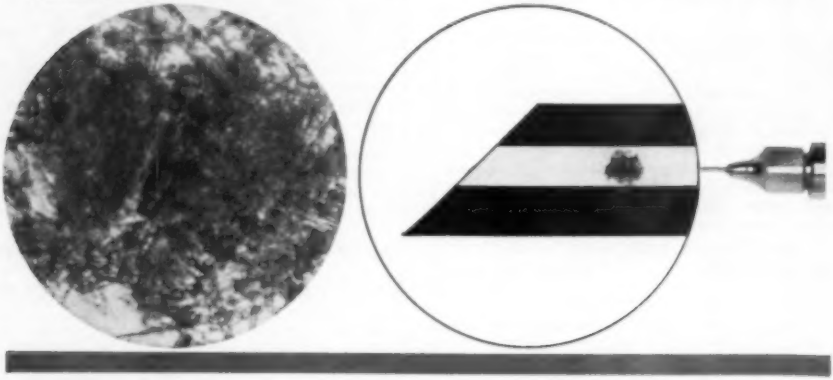
Northern Virginia Veterinary Conference, the second Tuesday of each month. Francis E. Mullen, 1130 S. Main St., Harrisonburg, Va., secretary-treasurer.

Northern Virginia Veterinary Society, the second Wednesday of every third month. Meeting place announced by letter. H. C. Newman, Box 145, Merrifield, secretary.

Southwest Virginia Veterinary Medical Association, the first Thursday of each month. I. D. Wilson, Blackburg, secretary.

WASHINGTON—Seattle Veterinary Medical Association, the third Monday of each month, Magnolia American Legion Hall, 2870 32nd W., Seattle, Wash. William S. Green, 9637 S. E. 36th, Mercer Island, Wash., secretary.

Clumping effect—Crystals tend to clump. This clump is not an unusually large one. Without magnification it is visible as a speck.



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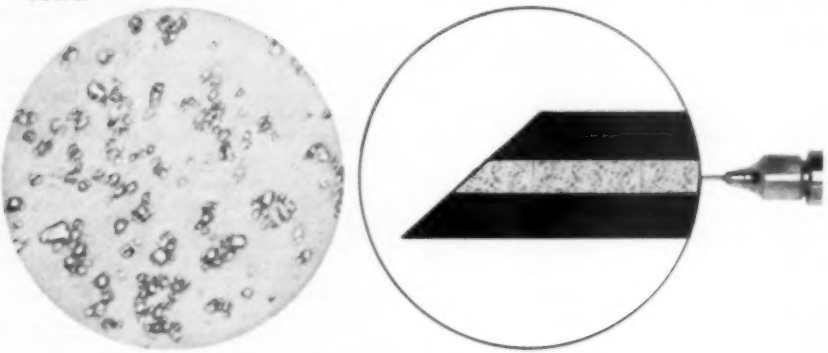

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South Puget Sound Veterinary Association, the second Thursday of each month except July and August. O. I. Bailey, P. O. Box 906, Olympia, Wash., secretary.

WEST VIRGINIA—Kyowva (Ky., Ohio, W. Va.) Veterinary Medical Association, the second Thursday of each month in the Hotel Pritchard, Huntington, W. Va., at 8:30 p.m. Harry J. Fallon, 200 5th St., W. Huntington, W. Va., secretary.

WISCONSIN—Central Wisconsin Veterinary Medical Association, the second Tuesday of each quarter (March, June, Sept., Dec.). D. F. Ludvigson, Ridgeland, Wis., secretary.

Dane County Veterinary Medical Association, the second Thursday of each month. Dr. E. P. Pope, 409 Farley Ave., Madison, Wis., secretary.

Milwaukee Veterinary Medical Association, the third Tuesday of each month, at the Half-Way House, Blue Mound Rd. Dr. R. H. Steinkraus, 7701 N. 59th St., Milwaukee, Wis., secretary.

Northeastern Wisconsin Veterinary Medical Association, the third Wednesday in April. William Madson, 218 E. Washington St., Appleton, Wis., secretary.

Rock Valley Veterinary Medical Association, the first Wednesday of each month. W. E. Lyle, P. O. Box 107, Deerfield, Wis., secretary.

Southeastern Veterinary Medical Association, the third Thursday of each month. John R. Curtis, 419 Cook St., Portage, Wis., secretary.

Wisconsin Valley Veterinary Medical Association, the second Tuesday of every other month. E. S. Scobell, Rt. 2, Wausau, Wis., secretary.

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DEADLINES

1st of month issue — 8th of month preceding date of issue.

15th of month issue — 22nd of month preceding date of issue.

Names of classified advertisers using key letters can not be supplied. Address your reply to the box number, c/o JOURNAL of the AVMA, 600 S. Michigan Ave., Chicago 5, Ill., and it will be sent to the advertiser.

Wanted—Veterinarians

County livestock inspector—$677 to $842 per month. Must possess a valid license to practice as a veterinarian in California and have four years of experience practicing veterinary medicine. For applications and information write Orange County Personnel Office, 801-C North Broadway, Santa Ana, Calif.

Wanted—veterinarian for Chicago small animal hospital, to assist two other veterinarians. Apartment available. Include college and year of graduation, experience, references, salary expected in application. Address "Box P 20," c/o JOURNAL of the AVMA.

Veterinarian for small animal charity clinic of excellent professional standing. Permanent; no evenings or Sundays. The Anti-Cruelty Society, 157 W. Grand, Chicago 10, Ill.

Veterinarian to assist in long-established, well-equipped hospital. Give experience, salary expected. Owner will retire in few months; will lease or sell with small payment down. Address "Box P 27," c/o JOURNAL of the AVMA.

Wanted—veterinarian with Maryland license to take over small animal hospital near Baltimore while on vacation; after February 10. Excellent opportunity to pick up experience. Address "Box P 33," c/o JOURNAL of the AVMA.

Wanted—Positions

Veterinary attendant—ten years' experience hospital maintenance, grooming all breeds. Age 45, married, sober and reliable. Florida preferred. Address "Box P 28," c/o JOURNAL of the AVMA.

Desire association with equine practitioner, anywhere. Interested in gaining equine practice experience. All replies answered and confidential. Address "Box P 31," c/o JOURNAL of the AVMA.

To insure prompt delivery replies should be carefully addressed.

Wanted—Practices

Graduate AVMA-approved school wishes to purchase well-established large animal practice in Illinois. Veteran, early thirties, seven years' experience in dairy practice. Address "Box P 26," c/o JOURNAL of the AVMA.

Desire to purchase or lease general practice in Middlewest or West. Willing to work for owner prior to purchasing or leasing. Address "Box P 30," c/o JOURNAL of the AVMA.

Texas—to purchase small animal hospital; will consider partnership. Nine years' practice experience; have Texas license. Address "Box P 32," c/o JOURNAL of the AVMA.

OSU graduate, 9 years' best practice experience, 33, veteran, desires purchase or lease of going small animal or mixed practice. Ohio, Indiana, Illinois licenses. Any good location considered. Address "Box P 35," c/o JOURNAL of the AVMA.

For Sale or Lease—Practices

For sale—in intermountain area, well-established mixed practice. Two acres, ranch-type brick home, attached clinic, drugs, and equipment, including 2-way radio. Address "Box P 2," c/o JOURNAL of the AVMA.

For sale—long-established fashionable small animal practice. Beautiful hospital, home, and grounds; located east central New England. Owner desires to retire. Address "Box P 5," c/o JOURNAL of the AVMA.

Established large animal practice in southern Michigan. Owner going into partnership. Low investment—drugs and house equity. A wonderful opportunity for recent graduate who desires good practice with a low investment. Address "Box P 10," c/o JOURNAL of the AVMA.

Dairy cattle practice in east central Wisconsin includes 7-room modern home with office and mobile radio equipment. Grossed $25,000 last year. Needs $5,000 cash to handle. Address "Box P 13," c/o JOURNAL of the AVMA.

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For sale or rent—small animal hospital with apartments. Long-established, good clientele. Located New York City. Address "Box P 25," c/o JOURNAL of the AVMA.

For lease—with option, northern New England small animal hospital and furnished home. Some good large animal; available October. References required; replies confidential. Address "Box P 34," c/o JOURNAL of the AVMA.

For sale—large animal practice in Illinois grossing approximately $30,000. Drugs and equipment; no real estate. Address "Box P 18," c/o JOURNAL of the AVMA.

For lease with option—hospital and residence in small northern Ohio town. Practice growing steadily, especially small animal. Address "Box P 29," c/o JOURNAL of the AVMA.

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Index to Advertisers in This Issue

Abbott Laboratories	7
Aetna Casualty & Surety Co.	35
Affiliated Laboratories Corporation	13
Armour Veterinary Laboratories	14, 41
Associated Veterinary Laboratories	16, 17
Bandy Laboratories, Inc.	26
Birtcher Corp., The	23
Ciba Pharmaceutical Products, Inc.	22
Colwell Publishing Co.	48
Corn Belt Laboratories, Inc.	4
Corn States Laboratories, Inc.	2nd cover
Eaton Laboratories	36, 43
Fort Dodge Laboratories	10, 11, 24
G.L.F.	32
Hamilton Pharmacal Co.	30, 31
Hill Packing Company	19
Jensen-Salsbery Laboratories, Inc.	39, 4th cover
MacAllan Laboratories	48
Massengill Company, S. E.	18, 45
Merck & Co., Inc.	34
National Band & Tag Co.	33
National Laboratories Corporation	21
Norden Laboratories	1
Parke, Davis & Company	25
Pitman-Moore Company	3, 3rd cover
Professional Printing Company, Inc.	6
Research Laboratories, Inc.	44
Schering Corp.	9
Swift and Co.	20
Upjohn and Company	47
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